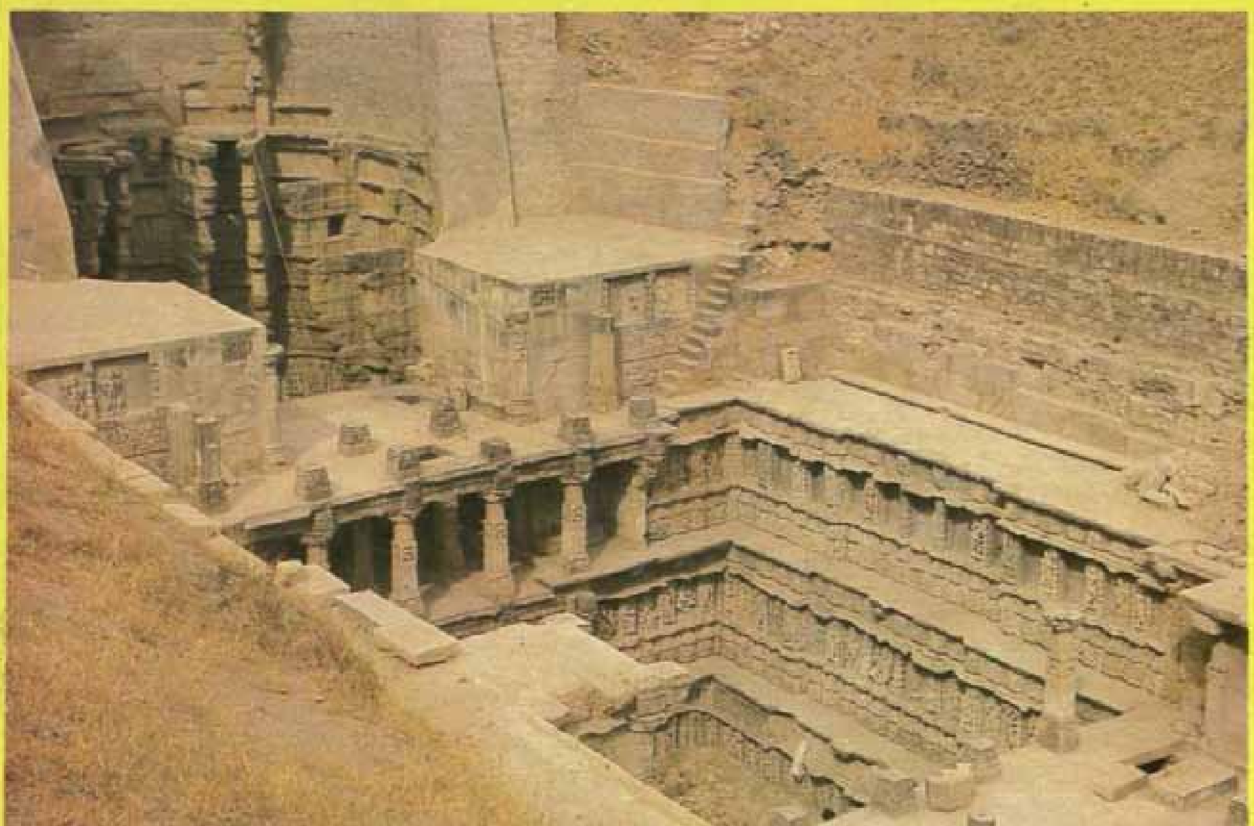
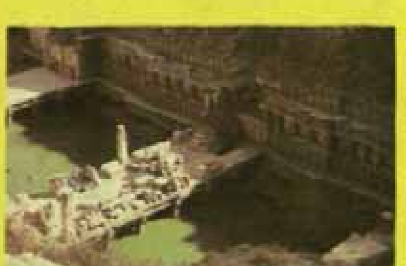
INDIAN ARCHAEOLOGY

1983-84 — A REVIEW









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1983 – 84-A REVIEW

Editor
M.S. NAGARAJA RAO
Director General
Archaeological Survey of India

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PREFACE

Archaeological Survey of India is happy to place before the scholars 'Indian Archaeology 1983-84 — A Review' within six months of publishing 'Indian Archaeology 1982-83 - A Review'. 'Indian Archaeology 1984-85 - A Review' is already in the press. We have sought information for 'Indian Archaeology 1985-86 — A Review', from all the institutions in India engaged in Archaeological Research. As we are receiving cooperation from all, we hope to publish 'Indian Archaeology 1985-86 — A Review by September 1986.

Thanks to the encouragement we are receiving from the Government, particularly our Secretary (Culture), Shri Y.S. Das, there is a new enthusiasm in the activities of the Archaeological Survey of India. This is very well reflected in our thrust on publications. We are happy to announce, that we have already published the following Reports under the series 'Memoir':

Lothal 1955-62, Volume II
Satanikota 1977-80

We also hope to place the following volumes under the above Series before the scholars within three months:

Excavations at Daimabad 1976-79,
Excavations at Nagda and
The Caves of Panhale-Kaji.

We have also initiated a programme of publishing unpublished reports of excavations.

All this would not have been possible but for the enthusiastic cooperation extended by my colleagues. I must particularly mention Shri K.N. Dikshit, Director (Publications) who has been working untiringly to gear up the publication wing to face the challenging task of removing criticisms against the Archaeological Survey of India for the delay in its publication programme. He is being ably assisted by Shri K.P. Padhy. To both these colleagues, my grateful thanks are due. But for the ready response from all the institutions, engaged in archaeological research, Departments of Archaeology of all the States, Union Territories and Universities, we would not have been able to present in this volume the results of archaeological research in the country. To them and to my own colleagues in the Circles and Branches in the Survey, I would like to extend my heartfelt thanks. Last but not the least, the Survey is grateful to M/s VAP Enterprises for its commendable job in bringing out 'Indian Archaeology - A Review' in an attractive form.

New Delhi
31-3-1986

M.S.Nagaraja Rao
Director General

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District Mehsana (Gujarat).

EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. Excavation at Gandlur, District Guntur.— In continuation of the last year's work *(Indian Archaeology; 1982-83 — A Review[1], pp 1-2)* the Department of History and Archaeology, Nagarjuna University, under the direction of B.R. Subrahmanyam, assisted by B. David Raju and V.V. Madhusudana Rao, resumed excavations with a view to exposing the details of pit-dwelling culture and to tracing the plan of settlement. The present work was concentrated in the area marked 'Gandlur III'. The occupational deposit measuring about 0.94m at the maximum was composed of three strata. A total number of twenty-six trenches was laid and the excavated area measured 935 sq.m. The surface layer one was much disturbed by tillage. In seventeen trenches, covering 584 sq.m., of area, there were thrity-two dwelling pits of different sizes and shapes. These were all contemporary with the earliest at layer three. The neolithic occupation at Gandlur resolves into two phases, the first phase characterised by pit dwellings while the second by house floors. The Phase I was characterized by these pits of various sizes and shapes but not evenly distributed over the area. The dwelling pits included pot-bellied, cylindrical, stepped, shallow, bipartite, tripartite and quadrupartite ones. They have circular or oval openings and neatly chiselled floors. The excavation showed that there were about twelve dwelling units. Out of these, only two pits were abandoned, one after a child burial; the other had an animal skeleton thrown into it.

There were several unrelated pits, two of them stepped-and-pot-bellied (1.1 m deep x 1.5 m wide and 0.97 m deep x 1.75 m wide); two pot bellied (0.55 m deep x 1.6 m wide and 0.48 m deep x 1.8 m wide); one shallow (0.1 m deep x 1.2 m wide). Three other pits were partially excavated.

Post-holes occur- throughtout the site, particularly near the openings of the dwelling pits. But in most cases, they do not clearly indicate plans of the shelters raised over the pits.

From inside the pits of the dwelling complex, objects of household use were recovered. These included a fragmentary quern, several mullers, pounders, belt hammers, a few stone axes, microliths, dabbars, clay and steatite beads and one terracotta lamp, which interestingly has a tubular provision for inserting wick. Clods of burnt earth were a recurrent phenomenon in the pits; a complete hearth except for one near the rim of the quardrupartite pit was not noticed elsewhere. Pottery and animal bones have been found both inside and outside the dwelling pits. Occasionally full pots in fragments were also present in the pits. The pottery was handmade with coarse fabric. Most of the animal bones appear to be of cattle. There were

1 This publication is referred to in the following pages by the year only.

many cut and charred bones of cattle, probably suggesting consumption of beef. Food grains were also recovered from the dwelling pits which throw some valuable light on the agricultural practices and dietary habits of the people.

The child burial associated with Phase I was a pot burial inside a dwelling pit. The pot, a medium sized one, covered with lid (which was actually the bottom of another vessel) contained some teeth and bones of an infant. There were, however, no burial goods.

In the second phase of the Neolithic Culture, house floors and post-holes were discovered from layer two in the southern part of the excavated area, which indicates that the people in this phase started building houses. The floors made of lime mixed earth are thin and on plan either semi-circular and sub-rectangular. The most extensive floor of sub-rectangular type measures 3.25 m while the smallest one on the same plan, measures 1.25 x 1 m. One of the semi-circular floors, outlined by post-holes measures 2.5 x 2 m. On the surface of the large floor a number of fragmentary pots, animal bones, mullers and stones have been found. There was a sunken vessel in one of the floors, whereas another floor shows a child burial in pit, in a much disturbed condition. In the northern portion of the excavated area a house floor with five regularly spaced post-holes was discovered. But only a part of the floor was inside the excavated area.

An interesting discovery, however, is a deep cylindrical pit, l m wide x 1.94 m deep, cut into the rock. The pit is too deep and narrow; so it might have served as a well for the supply of water. The antiquities from this phase are more or less similar to those recovered from the earlier phase.

2. Excavation at Vaddamanu, District Guntur.— The excavation at Vaddamanu by the Birla Archaeological & Cultural Research Institute under the direction of T.V.G. Sastri, assisted by Kasturi, M. Veerender and G.V. Ramakrishan Rao, has confirmed the chronology of the site reported earlier (82-83, pp. 2-3). In VDM-IV, it has also brought to light the existence of another stupa of the post-Asokan period. This was located at the highest point of the hill towards the south-western corner (Plate I). This incidentally confirmed the earlier evidences of the sketches of two stupas on a rock.

Besides, there is evidence for the continuation of the main step-way leading to this stupa at the summit of the hill.

The excavated stupa has a diameter of 11.2 m and its base was raised by receding tiers on the northern and the eastern sides. There was evidence of circular brick formation on the fop of the tiers indicating the base of the stupa.

For the construction of the stupa in VDM-IV, a natural rock projection towards the south-western comer of the hill was utilised. Medium sized granite boulders were used in rising the tiers. An ascent to the summit was provided by cutting tiers on the northern slope and providing steps each with blocks of granite 1.75 m in length. This 'stairway' was connected to the step-way through the gorge. It was re-aligned during the Ikshvaku period when a well plastered brick balustrade was added. There is evidence for a limestone railing with a *torana* at the centre. Fragmentary *ushnishas, suchis* and pillars which formed part of the railing were re-

covered from the excavation. The representation of stylised lotus, other floral ornamentations and human figures show a similarity to the art tradition of Bharhut, datable to *circa* second Century B.C. (Plates 2 & 3). On the basis of finds such as bricks, punch-marked coins, black-and-red ware pottery recovered from the excavated area, the stupa complex appears to be of post-Asokan period.

During the succeeding phase of the stupa, the excavation revealed the evidence of super-imposition of Vishnukundin structures over those of the Ikshvakus in VDM-III & IV. The Ikshvakus had erected the viharas at different levels on the eastern side of the hill which were disturbed by the Vishnukudins by building right over the plinths of the vihara an 'Assembly Hall' over-looking the village.

Further probing into the lower terrace of VDM-II revealed the existence of two phases of Ikshvaku construction. The steps leading to the vihara across the first stupa in VDM-II was found re-oriented and shifted towards the south. In the earlier phase, steps were provided from a passage along the northern boundary wall of the pillared hall at the top with access from the north. A subsidiary entrance was also provided from the west as evident from a *Chandrasila* — half-moonstone pedestal. In the later stage, the earlier steps were dismantled and new steps were laid to enter the pillared hall from the natural rock to the pathway from the western side. In both the phases, however, there is evidence of a landing half-way up the steps. A natural gorge in the adjacent Anantavaram Hill according to the local people was called the trail of elephants — *'anugujalu'*. From this it could be inferred that the flat area measuring 18 m x 6 m on the lower slope of the eastern side could be an elephant stable for at least two or three elephants. It has yielded Satavahana Coins and is associated with early historic pottery.

3. Excavation at Ramapuram, District Karnool.— In continuation of last year's work, (1982-83, pp.3-6) the Excavations Branch (I) of the Archaeological Survey of India[1], Nagpur, resumed excavations at Ramapuran under the direction of B. Narasimhaiah, with a view to understanding more about the settlement pattern and mode of life of the chalcolithic people at the site. He was assisted by Sarvashri B.P. Bopardikar, S.K. Lekhwani, D.K. Ambastha, S.K. Mitra, J.N. Gandhi, Mohinder Singh, S.V. Sutaone, P.M. Bhope, R.K. Dwivedi, Ramesh Kumar, P.C. Raju, R.K. Roy, M.U. Qureshi, A.U. Ganar, Kumari Subhra Naskar and K. Ismail.

This season's excavation in an area of 11,000 sq.m., revealed thirty-four circular (diameter ranging from 9.30 m to 2.55 m) and five oval (dimensions varying from 5.75 x 5.20 m to 3.15 x 2.85 m) house-plans belonging to period I A. It is needless to say that the method adopted in the construction of these houses was the same as noticed in the later phases. However, an interesting feature noticed here was : the clusters of houses were provided with silos which were invariably dug outside the houses. These silos were peculiar only to this phase because in the succeeding phase (Period IB) they were either filled up with rubbish or converted into animal burials. In contrast, as already mentioned, people of Period IB and IC preferred bins, built above the ground over a specially prepared platform.

[1] The Archaeological Survey of India is referred to in following pages as the 'Survey'.

As evidenced, people of Period IA buried their dead children either inside the house or ouside. They adopted five modes of burial in disposing their dead children. They were : horizontal mouth-to-mouth urn, horizontal single urn, vertical single urn, inverted single urn (pl. 4) and shallow pit burials (pl. 5). They were either secondary or primary, but invariably without any burial furniture. Significantly, all these burials of this phase were for infants, aged below three years.

Besides the usual pottery types (1980-81pp. 4-5) mention may be made of a painted jar and a miniature lipped bowl, both in red ware. The jar has a base with mat impression. Its shoulder is painted with applique cord design.

Important antiquities recovered include: terracotta bull head, painted pig with hollow body (pl. 6), pendant, disc, hopscotches; diamond shaped shell bead; stone objects such as a weight of almost cubical shape weighing 2,400 gms, sling balls, saddle querns, pestles and celts.

Period IB may be divided into two sub-phases 1 and 2. Sub-phase 1 is represented by fifty-three circular (diameter ranging between 5.70 and 1.60 m) and eleven oval (dimensions ranging from 5.82 x 5.20 to 3.45 x 2.88 m) house-plans, whereas sub-phase 2 yielded thrity-nine circular (diameter ranging from 6.50 to 3.10 m) and six oval (dimensions ranging between 5.10 x 4.60 and 3.70 x 3.20 m) house-plans.

All together nine burials represented by a single horizontal urn, horizontal mouth-to-mouth double urn, horizontal vase kept in an inverted vase and shallow pit burials belonging to this phase were exposed. However, the shallow pit mode of burial dominated with five examples and others with one each. Interestingly, one shallow pit burial had only the skull and long bones of a goat, but no human remains. The burial furniture invariably included either skull or full skeleton of a goat, spouted vessel and deep bowls. The burials which were either primary or secondary were all of children (pl. 7).

In addition to the usual types of pottery, noteworthy types encountered during this season from phase B were: bowl with closing rim, big spouted vase with elongated tapering neck and blunt carination (pl. 8) both in grey ware; and boat-shaped deep bowl with channel-like lugs on either side a goblet, miniature spouted vase and a squarish ink-pot like vase (pl. 9) all in red ware, some with slip. However, a narrow mouthed vase in grey ware bearing incisions of six stylised bulls around its body was encountered for the first time at the site.

Among the antiquities mention may be made of a copper parer; terracotta truncated conical weight with finger depressions on either side weighing 1,950 gm, bull heads, broken bull Figurine, a bull head attached to a bowl in grey ware, hopscotches, unfinished bead and spindle whorls; beads in chalcedony and shell; and stone saddle querns, pestles and celts. A necklace of forty-one steatite disc beads was found in a pit (pl. 10).

In addition to the information gathered in previous seasons' work (1982-83, pp. 3-6) two sub-phases represented by layers two and three of Period IC revealed respectively ten and eleven more houses with their diameter ranging from 6.60 to 2.75 m.

Nine more burials represented by cists, horizontal mouth-to-mouth double urn, vertical-cum-horizontal urn, single vertical urn and vertical mouth-to-mouth double urn burials were exposed during this season. As mentioned earlier, the burials of this phase revealed skeletons or

skeletal remains of either children or adults with black-and-red ware pottery and iron objects as indispensable burial furniture.

Mention may be made of two new additions to the large quantity of pottery assemblage of this phase. They were : a hollow based red ware vase with horn like applique decorations inserted in perforations made all around the body; a water pitcher, also in red ware, having a bull figure among the usual linear designs painted in black on its body ; and a red ware bowl with vertical lug handle.

Important antiquities recovered include: copper antimony rods, parers; terracotta bulls, spindle whorls, and stone saddle querns, pestles, sling balls and celts.

However, the most significant finds were three triangular anthropomorphic figures made on thin Cuddapah stone slabs associated with animal bones and black-and-red ware pottery found in three different pits.

Nine more hearths/kilns of which a few found right on the natural soil containing ash and charcoal were exposed during this season's work.

Another important result of this year's operation was the discovery of microliths yielding level underlying the deposit of Period IA. However, it could not be ascertained whether this level represents mesolithic or pre-pottery neolithic period.

4. Excavation at Hazurnagar, District Nalgonda.— The Department of Archaeology and Museums, Andhra Pradesh, conducted a small scale excavation in order to expose a multi-chambered cist burial. The cist, which was of swastika shape on plan, was provided with a prefacing passage chamber. From the excavations it appears that a number of smaller chambers were also in existence inside the cist and a few added from time to time around the main cist, for placing burial goods. Fragmentary skeletal remains of secondary burials were noticed in some of these chambers. These chambers were all used for placing grave goods like pottery, beads and iron objects. In one of the chambers, besides the typical black and red ware pottery, a carnelian bead of 1.4 cms. x 1.3 cm size with fourteen facets was found. Pre-firing marks like bow and arrow on some potsherds were however, very interesting.

5. Exploration in Srikakulam.— S. Krishan Rao of the Department of Anthropology, Andhra University, Waltair-under the guidance of K.T. Reddy explored Srikakulam region, which is mostly covered by forests and hilly tracts inhabited by different tribal groups, to study the prehistoric sites located in the valleys of Nagavali and Vamsadhara Rivers and their tributaries. Nagavali River with its tributaries Suvarnamukhi, Gomukhi, Vegavati and Votti-gedda and Vamsadhara River with its tributary Mahendratanaya are the two major rivers that originate in Orissa at Rayaghad and Jaypore hill ranges respectively and flow through the Sri kakulam region before entering the Bay of Bengal in south-east.

The archaeological sites so far explored have shown mesolithic and neolithic evidence although the megalithic cultural evidence was also noticed in the form of chromlechs found at the site called Pandavulametta, located on the left side of the Amudalavalasa — Hiramandalam Road, 6.4 km away from Amudalavalasa. Potsherds were also collected. The sites near and

around Kopparavalasa, Majjiramudupeta of Palakonda taluk; Komarada, Ladda, Ravivalasa of Parvatipuram taluk are situated along the Nagavali River. The distance of the sites from the river varies from 200 to 500 metres. Geometric and non-geometric microliths, fluted cores and flakes made on chert and quartz were collected. The raw material chert varies from brown to red in patination. Rubbers and maceheads were collected from Ladda and Ravivalasa.

Kopparavalasa.— This is situated about 5 km away from a point on the Palakonda — Pravathipuram road and the distance from Palakonda to the road point is being about 16 km.

Majjiramudupeta.— The site is situated at a distance of about 9 km south of Palakonda.

Komarada.— It is located at a distance of about 13 km north of Parvatipuram and it is on the right side of Parvati-puram.

Ladda.— It is located at a distance of about 30 km away from Parvatipuram towards the north and it is on the right side of the Rayaghad route.

Ravivalasa.— The site is situated at a distance of about 16 km away from Parvatipuram on the right side of Parvatipuram-Palakonda Road.

Konda Bucchimpeta, Makkuva, Gunikonda sites of Salur taluk are situated at distances varying from one to three km away from Suvarnamukhi River valley. The significance of these sites is the existence of prehistoric rock shelters. .A site at Konda Bucchimpeta (which is situated at a distance of about 16 km away from Salur) has revealed two phases, viz. pre-pottery neolithic and neolithic potshreds with incised marks. Three molar teeth, a few fragments of limbs belonging to *equs ferous f. domesticus* (domesticated Horse) were found at 80 cm below the surface. Few chert blades and flakes were also collected along with the above evidence.

The sites Dasarathiguda, Ippamanuguda, Nayuduguda of Palakonda Taluk, Sattinaguda, Rupabhadra of Gunupur taluk and Siripur, Kolasingu, Ramachandrapuram of Parlakimidi taluk are located in the river valley of Vamsadhara and Mahendratanaya. The former four sites are located with in a radius of about 200 m away from either bank of the river, while Rupabhadra is situated at a distance of about 7 km north of Gunupur, Siripur, Kolasingu and Ramachandrapuram are located within a radius of 5 km north, 16 and 19 km south of Parla-kimidi respectively. The cultural material collected includes microliths made on quartz and chert, chisels and also flakes, cores, saddle querns, rubbers, and maceheads. Mesolithic tools and neolithic ground and polished tools and carnelian beads of various shapes, viz. barrel, spherical and round, along with unburnished coarse and thin red ware found at Banjaripeta, Addakulaguda, Kurumpeta, Burjaivalasa, Artam, Gucchimi, Bottadivalasa, Nimmalapadu, Che-llivalasa and Damanu Konda.

Banjaripeta (Tekkali Talu).— It is situated at a distance of about 16 km away from Tekkali.

Addakulaguda (Phlakonda **Taluk).—** This site is located 8 km away from Palakonda on right side of Palakonda Seetampeta road.

Kurumpeta (Palakonda Taluk).— It is located 7 km away from Palakonda on the left side of the Palakonda-Parvatipuram road.

Burjaivalasa (Bobbili Taluk).- The site is located at a distance of about 8 km away from Salur on the right side of the Salur-Vizianagaram road.

Artam (Parvatipuram Taluk).— This is located at the distance of about 7 km away from Parvatipuram (North) and on the left side of the Parvatipuram-Rayaghad road.

Gucchimi (Parvatipuarm Taluk).— The site is situated at a distance of 9 km from Parvatipuram (South) on the right side of the road from Parvatipuram to Vizianagaram.

Bottadivalasa (Salur Taluk).— It is located at the foot of the hill called Chitrakota. Parva-tamu. This is at a distance of 3 km on the right side of the Salur-Makkuva road. The distance from Salur to the prehistoric site, Bottadivalasa is about 7 km.

The sites *Chellivalasa* and *Nimmalapadu* are also situated on the right side of the Salur-Makkuva road and the distance from Bottadivalasa could be further extended by 400 m from its preceding site.

Damanukonda (Salur).— This site is located to the south of Salur at a distance of about 3 km from Salur, crossing Vegavathi River.

A trial trench in the eroding section at Bottadivalasa revealed neolithic urn burial. The pots are kept face-to-face and measuring 32.5 x 34 cm and 30 x 29 cm. The burial is in east — west orientation. The neolithic material includes two hoes, ground and polished rectangular tools, microliths and hand-made pottery of both thick, coarse and thin red ware.

6. Excavation at Bavikonda, District Vishakhapatnam.— The Department of Archaeo logy and Museums, Andhra Pradesh carried out excavations at this extensive Buddhist settle ment on a hill top at Bavikonda in the Bhimili taluk, and brought to light four stupas, four *chaityas* and a monastic complex comprising twenty-four celled vihara. An inscribed stone slab containing Brahmi characters of fourth century A.D. and reading 'Ti' and 'La' was found.

7. Explorations in District Vishakhapatnam.— Naseem Ammer, of the Department of Anthropology, Andhra university, Waltair, under the guidance of K.T. Reddy explored the hill ranges of the Eastern Ghats in Vishakhapatnam District. The region is drained by Sarada, Gostani, Gambheeram, Varaha and several other streams. About twenty-four neolithic sites have been located which are grouped under (a) Coastal, (b) Inland and (c) Hilly sites. The sites at Madhurawada, Paradesipalem, Boredupalem Marikavalasa, Vadapalem, Rishi Konda — all in Madhurawada basin — constitute coastal sites. Of these sites Paradesipalem, Boredupalem, Marikavalasa yielded rich evidence of neolithic cultural remains. Sections exposed by gully erosion at Paradesipalem have been scrapped. An urn burial in east-west orientation having grave goods was exposed from Locality I. About 50 m north of this, parts of stone slabs (210 x 60 x 60 cm) projecting outside are found as covers to a cist like burial. Stone alignments of rectangular and square type (16 x 10 m) and (28 x 28 m) respectively are exposed from Locality II. Locality III lies north of Locality II where microlith polished stone tools and pottery have been collected.

Paradesipalem: (PDP).— The village is about 16 km on west of Agnampudi.

Gadaburu (GDB).— Village is 5 km from Madugula and lies in north-west corner of the basin. The neolothic site is located about 1 km east of the village.

Jalampalle (JLP).- Village is 2 km south-west of Gadabur and is situated on the

north-east corner of Madugula basin. Site is about 500 m away from the village.

Kasipatnam (KSP).— The site lies at the north-west corner of the S.Kota basin adjacent to the 29th km stone on the S. Kota-Aruku road.

Chilakalgedda (CHG).- The Site is 6 km from S.Kota on the right side of S.Kota-Aruku road.

Two distinct neolithic horizons, characterizing Phase A and Phase B have been noticed at Paradesipalem, Museulavada, etc. while at several other sites the materials belong either to Phase A or Phase B. Phase A is observed between 50-60 cm below surface while Phase B is observed between 30-40 cm below surface.

The material remains include ground and polished stone tools, microliths, pottery, carne-lian beads, other objects besides the evidence of floor.

Dibbapalem (DBP).— The site is about 3 km north-west of Sontyam and about 1 km north of Gambheeram River.

Mamidilova (MPL).— As the name suggests the village is situated in a deep valley between two hillocks. Site is about 1 km south of the village.

Gudilova (GDL).— The site is situated on the left side Pendurthi — Bhimili highway beyond Sontyam.

Lankelapalem (LKP).— The village is 22 km from Visakhapatnam on the left side of Visa-khapatnam-Anakapalle highway. Prehistoric site is about 2 km from the village on the northwestern side.

Saravanipalem (SVP).— Village is 24 km from Visakhapatnam, on the right side of Visa-khapatnam-Anakapalli highway. The neolithic site is about 500 m away from the village.

Narapadu (NDP).— The site is approached through Saravanipalem and is about 3 km in the south-western direction.

Koduru (KDR).— The site lies 6 km north-west of Sabbavaram and in the center of the basin.

Dibbalapalem (DBP).— The village is 6 km from Gajuwaka junction on the left side of Visakhapatnam-Kanithi road. The site is about 1 km from the village.

Musalavada (MSD).— The village is 3 km west of Lankelapalem junction and is about 1 km north-east of the village.

Gnagavaram (GGV).— The site of Gangavaram is traced through Aganampudi junction. It lies 4 km north of Visakhapatnam-Vizianagaram road and about 2 km south-west of the village.

Boredupalem (BPL).— The village is 14 km from Visakhapatnam on the right side of Visa-khapatnam-Bhimili highway. The neolithic site is 1 km south-east of the village.

Marikavalasa (MKV).- The village is about 13 km from Visakhapatnam on the right side of Visakhapatnam-Vizianagaram Road. The site is about 1 - 5 km west of the village.

Madhurawada (MDV).— The site of Madhurawada is located on the left side of Visa-khapatnam-Bhimili high road near 21 km stone.

Vadapalem (VDP).- The village lies 10 km north of Visakhapatman on Visakhapatnam — Bhimili beach road. The site is 1.5 km away west **from this.**

Rishi Konda (RKD).- The village is **11 km on Visakhapatnam-Bhimili** beach road. The neolithic site is 1.5 km west of village.

Madhayakadamam (MDK).— The site is **located at the pass between Gorintla and Son-**tyam basin.

Pappalavanipalem (PVP).— The site is about 3 km north of Madhyakadaman and **1 km** of west of the village.

Bheemandrapalem (BMP).— The site is **2 km north-west of Bheemendrapalem village. It is** situated in a narrow valley with hills on three sides.

Sontyam (STM).— This village is in the north-east corner of basin. The site is to the north-east village.

8. Explorations in Lower Godavari Valley, District Bhadrachalam.— The explorations were carried out by K. Satyanarayana, of **Department of Anthropology, Andhra University,** Waltair, under the guidance of **K. Thimma Reddy. The work brought** to light 13 archaeological sites, 11 of them are megalithic sites. **The remaining 2 sites have yielded lower and Middle** palaeolithic evidence. The sites are located **near and around Bhadrachalam (200** km away from Rajahmundry). They are: Pandurangapuram, Tonga Togu, Rayanpeta, Polakamma Togu, Kammam Togu, Bugga and Mangapeta situated **on the right bank** of **the** River Godavari. The sites Tegada, Edira, Virabhadrapuram, Mukururu and Parmasala are situated on the left bank of the River Godavari. Cultural **material collected from these** sites include handaxes, chopper-chopping tools, scrapers of Lower palaeolithic **and** miniature handaxes, scrapers, points, borers characterizing Middle Palaeolithic. Postsherd of Black and Red ware, Black ware and Red ware and a few iron objects of Megalithic period were also found. Of the megalithic sites, Vemuluru, Rayanapeta and Pandurangapuram show a potentiality. A large number of Megalithic monuments such as Dohemens, Cairns, and Cist burials exist at these sites. Rock brus ings and paintings were also found near Kammam Togu. The subjects depicted most frequently are: deer and human figures with sticks suggesting hunting.

Trial pits in the eroding sections were dug at Vemuluru to know the chronology and nature of cultural material particularly of Megalithic period. Here a large number of Cromlechs were found on an elevated ground covering an area of 4.9 hectares of land. The monuments made up of huge orthostatic slabs of rectangular shape were found encircled by rough granite boulders. The chamber is made of 10 slabs. Two slabs measuring 4.1 x 3.2 x 1.2 feet were resting upon 6 slabs of roughly the same measurement. There were 2 each of the northern and southern sides, and one each on eastern and western sides. The pottery obtained from this burial is usually Megalithic black and Red ware. The main shapes represented being globular pots with flared mouth, small dishes and bowls. Iron objects found in this chamber comprises of dagger, adzes, sickle, arrow tip, etc.

ARUNACHAL PRADESH

9. Exploration in District Dibang Valley.— D.K. Borah of the State Department of Archaeology during the course of explorations at Dambuk noticed a rampart of undressed stones. Locally known as *Bengal Mimak Yapgo* meaning "rampart of war with the British".

10. Excavation at Parsi-Parlo, District Lower Subansiri.— A.A. Ashraf of the State Department of Archaeology conducted a trial excavation at Parsi-Parlo and discovered a few stone artefacts, potsherds, ground axes, chisel, round scraper and wasted blade.

ASSAM

11. Explorations in Tezpur, District Sonitpur.— The Directorate of Archaeology, Government of Assam explored Dah-Parvatiya, on the western outskirts of Tezpur. The greater part of Da-Parvatiya is well known for mounds containing brick and stone structures most of which are either destroyed or in the process of destruction. The modern Henguleswar Devalaya was constructed by exposing the *garbhagriha* of an old brick temple. Close to this old site was found a door-lintel (size 2.43 m x 60 cms x 46 cm) embossed with nine *kalpavrksas* on its upper register and a sunken lower register consisting of two plain *sakhas* with the figure of Ganesa in the *lalatavimba* posture, the two registers being intervened by a stepped corbel. The lintel is assignable to the eighth-ninth centuries A.D. time bracket. The use of *kalpavrksa* in the lintel, however, formed an important motif in the Brahmaputra Valley upto the ninth century A.D. This motif later appeared in the centre of the door-sills also.

At Silar a *namghar* (a modern prayer-hall) with twenty-four carved stone columns and beams have been found. They were used as supports to the roof of the namghar.

At the Baralimara Satra of Dah-Parvatiya (a neo-Vaisnavite establishment), remains of an old stone temple were noticed. The remains consist of one of the stone columns with an abacus with varying sunken designs and a tenon at its top. The columns resemble the pin style columns of Orissa of seventh century A.D. A standing image of Surya with two lotuses on either side, a standing two-armed image holding a lotus stalk being flanked by an attendant on either side and a corrugated metal piece are the noteworthy finds from the site.

At Gar Dol (Graha Dol) in the same locality an elevated flat area of about 100 metres square enclosed by an old earthen rampart was noticed. The rampart has been cut at certain points and was re-inforced with a brick core in recent time to drain out water.

The exploration also revealed the ruins of a brick temple at Sakarchuburi, a small locality in the Dah-Parvatiya region. A number of terracotta objects was found at the site. Of these, two panels are noteworthy.

At the neo-Vaisnavite Brahmachari Satra of Da-Chuburi of Dah-Parvatiya are preserved a few stone objects, which are said to have been exposed from the area while digging. The collection consists of a stone column of varying cross-section having an abacus embossed with carvings, three door lintels, two with plain *sakhas* and the third one decorated with *kalpavrksa*

motifs and a eight sided pillar richly carved and inset with sivalinga-like motifs.

At Baralimara Satra in the same area a mutilated brick-masonry structure was noticed. Inside the *manikuta* (cella) is enshrined the image of Ananta with two arms and a nine-hooded-serpent canopy. The figure is standing with his right hand in *abhayamudra* while the left one is holding akimbo.

At Ketekibari, on the outskrits of Tezpur, a massive *Mukhalinga* of more than four metres in height was found standing without the *Yonipitha* and its square lower portion was cut into four faces in facing four directions. Two of the faces-were missing while others were mutilated. A little away from the *linga* the *yoni-pitha* of the linga was found, broken into two parts.

Majgaon near Ketekibari yielded ruins of an old stone temple. The ruins consist of door-sills, jambs, lintels, and a few structural members including parts of *amalakas.* There were two door-sills with identical designs embossed with *kalpavrksas.* A door-jamb was found with receding *sakhas.* scrolls, diamond and wavy designs containing three *tribhanga* figures on full-blown lotuses at its base. The figure on the left carries a sword, and holds a trident in the central part; the third figure on the right stands on a *makara.* The images measure 1.98 m in height, 64 cm in width and 36 cm in depth. A lintel was noticed here, having five temple motifs, in its upper register and resting on corbelled brackets intervened with three arched frames and a tree on each finial. The *lalatavimba* contains a four armed seated Ganesa. These remains probably indicate the existence of temples belonging to two different periods ranging from the ninth to the twelfth century A.D.

The Bhairavi temple located on a hill in the eastern outskirts of Tezpur is a popular shrine of the Sakas. Access to it is through a long stairway from the foot of the hill. This area has revealed ruins of a stone temple dateable to the medieval period. The two ceiling slabs, one with an eight petalled *visvapadma* (size 2.10mxl.97m) and the other with a circle (size 1.45 m x 1.41 m) were noteworthy. The temple probably consisted of two chambers i.e. *a garbha-grha* and a *mandapa,* with its components profusely carved among the significant components from the ruins mention may be made of a column (71 cm x 57 cm x 2.85 m) part of a *beki* (diam. 1.15 m), a cruciform pillar capital carved with scrolls (48 cm x 48 cm), a block with a temple motif (58 cm x 46 cm x 46 cm), three *kalasas* (63 cm x 58 cm, 69 cm x 40 cm and 55 cm x 38 cm) and also a *Yala-head* (48 cm x 33 cm x 25 cm).

The village Barpukhuripar situated about two hundred metres to the west of Haleswar temple has a big old tank on the eastern embankment of which was found a temple with two images carved inside. One of them was that of four armed Brahama (size 1.50 m x 77 cm) having three faces, seated in *Lalitasana* on a lotus. Its *Saptaratha* base contained a swan at its center flanked by lotus, sevakas and scrolls. Only the portion behind the belly of the stele was carved in round. Other image (size 1.56 m x 76 cm) was of six-armed *nritta* Ganapati, dancing on a *padma.* Its pedestal was *saptaratha* which contained two figures of musicians, beating dhaka and a drum respectively. Both the images belong to twelfth century A.D. and represent the art of Senas.

BIHAR

12. Exploration in District Bhagalpur.— K.P. Chaudhary of the Mid-eastern Circle of the Survey, discovered sites yielding: i) black ware and red ware at Kumrail and Gawachalk; and ii) sculptures of Siva, Parvati, Kartikeya and Ganesa from a temple at Kailash Pahar during exploration.

13. Excavation at Taradih, District Gaya.— In continuation of the last season's work (1982-83 pp 16). Ajit Kumar Prasad (of the Directorate of Archaeology and Museums, Government of Bihar, Patna) assisted by Shri Lakshman Prasad Singh, Kedar Nath Singh, Parvez Akhtar, Shiya Sharan Singh, Sanjiv Ranjan, Ram Swaroop Singh, Prabal Gupta and Md. Sharffuddin undertook excavation, under the general guidance of Sita Ram Roy, of the mound lying to the south-west of the Mahabodhi Temple at Bodhgaya.

During the period under review only two trenches (viz no. IX and X) were laid out and trench no. VII, which was left incomplete last year, was also further excavated.

Period I represented the cultural deposit of the Chalcolithic complex immediately above the natural soil. The average thickness of the deposit measured 2 m. The archaeological evidence clearly indicated that the people of this period lived in houses made of mud, wattle-and daub. The remains of a successive floor of rammed earth were met in course of excavation. There was evidence of lime coated floors also.

The pottery in general was wheel-turned and included red, black, and black-and-red wares. The handmade specimens also occurred. The pottery contained a thick slip of varying colours, such as, chocolate red, deep red, light red, ochre red, pale red, etc. The cooking vessels had usually rusticated base. The storage jars were without 'any slip.

A few potsherds from the late level were over fired and exhibited a blotchy surface. Other important antiquities of the period included beads of terracotta, stone, conch, steatite and button shaped beads of indeterminate material quern, ball and hammer of stones, ear lobe, terracotta bull and animal head, arrow heads, pins and bone tools, (pl. 11).

Period II was distinguished by the appearance of iron. The black and red ware, black ware and red ware of the earlier period continued in this period with much improved quality and fabric. These were made of well levigated clay and well-fired. The core of these specimens do not show any mixture of paddy husks with clay. Their fabric ranges from medium to fine and they produce a metallic sound. Evidence of paddy husks in big pots and glazed surface, of the black-and-red and black wares was also significant. The black-slipped ware and grey ware also appeared in association with iron. The pottery types consisted of vase, *handi,* rimless *handi,* storage jar, *lota* shaped bowl, basin, lipped bowl, lid-cum bowl, etc. A few potsherds also contained graffitti marks.

The remains of lime coated rammed floors and hearths were also noticed.

Among the notable iron antiquities mention may be made of arrow-heads, spear-heads, etc. The objects of stone comprised of beads, ball, pestle, etc. of bone included arrow head, pin, point, nose stud, etc and of copper only bangle.

Period IIB was marked by the appearance of the Northern Black Polished ware, although the black-and red ware also continued but less frequently. Several new shapes of red ware and black-slipped ware made their appearance during this period. The noteworthy types included vase of out-curved thickened rim and out-curved beaded rim, dish with sharp carination at the waist, bowl with averted rim, bowl with horizontally splayed-out rim, basin with beaded rim, lipped basin, lid-cum-bowl, flat-based bowl and trough, etc. The antiquities included beads of semi-precious stones, stone ball, pestle, and nose stud; bone arrow head, pin, point, stylus and bead, and bangle, bead, needle rod, ear-ring made of copper. While the terracotta objects include symbol bearing sealing, bead, ball, ear lobe and bangle.

Period III was characterized by the red ware belonging to the Kushana Period. Types included *surahi,* frying pan with handle and flat-based bowl, etc. Beads of terracotta and semi-precious stones were among the important finds.

Period IV was distinguished by the appearance of Gupta and late Gupta antiquities, burnt brick structures probably a monastic complex, terracotta beads, bangles, balls and ear lobe and beads of semi-precious stones.

Period V was marked by burnt brick structures probably of a monastic establishment (pl. 12). The finds of the period were seal and sealings (pls. 13 & 14), bead of semi-precious stones and terracotta.

14. Excavation at Paisra, District Monghyr.— In continuation of earlier work (IAR 1980-81, p. 9), Vidula Jayaswal and P.C. Pant of the Department of Ancient Indian history, Culture and Archaeology, Banaras Hindu University undertook excavation and intensive plotting of the Acheulian levels around Paisra village. The extensive Acheulian habitat, having an area of about 2.5 sq. km. was divided into five localities (A to E). The earlier probings were confined primarily to the locality A, lying north-east of the Paisra Rest House, while this season's work was carried out in all the other remaining four localities.

The most significant findings of this season's work were the massive stone alignment unearthed at locality E and the working floors with post-holes exposed at locality C. The former seems to be the earliest evidence or construction reported anywhere so far, while the latter suggests building of temporary shelters at the working floors by the Acheulian man.

A trench measuring 15 x 5 m was laid in the locality B, where the evidence for an Acheulian habitational floor was noticed. Artifacts were found lying on the shale-surface in a thin layer of tiny hematite nodules. The trench laid in the localities C & D yielded definite evidence of working floors littered with a very large number of artifacts, including handaxe, cleaver, scraper, core, flake and waste products. In the trench of the locality C, measuring 7 x 4 m, a couple of rough alignments of medium sized blocks of quartzite, presumably laid by man himself were observed. As many as 12 trenches, measuring 2 x 2 m each were laid in the locality D, with a view to exposing the Acheulian floor horizontally. The undulating rock surface was found, which is not only very rich in Acheulian implements, by-products and blocks of raw material, but it also contains a number of post-holes. It was interesting to note that the post-holes occur mostly in a group of two separated from each other by 80 cm to lm.

The evidence clearly indicated that the Acheulian man constructed small temporary huts of an inverted V shape in the working spots also.

Two trenches were laid in the locality E, lying west of Paisra village. In one of the trenches (Trench I) measuring 5 x 5 m., a massive stone alignment of 4.20 m, made of big blocks of stones was exposed at the depth of 2.80 m. It runs into the section facing north-east, and its complete plan will be available after next season's work. Besides there is another alignment of medium sized stones in the south-western corner of this trench, seemingly forming a pattern. A limited number of stone artifacts was recovered from the perphery of these stone alignments. The excavation at all the five localities confirmed that the Achedulian artifacts occurred immediately above the underlying shales, suggesting thereby that the prehistoric man settled at Paisra directly on the rock surface. The evidence from the localities C, D & E indicated that, after the end of the Acheulian culture, the areas experienced a long spell of dry climate, during which huge masses of rock debris were produced by mechanical weathering. In the Trench I of the locality E the Acheulian layer was overlain by a thick deposit of over 2 m of decomposed shales. The process of chemical weathering of this shale debris and the tiny hematite modules must have started during a subsequent wet phase. The upper deposits were mostly composed of recent alluviums.

The lithic industry of Paisra was characterized by very symmetrical cordiform and lanceolate handaxes, typical flake-cleavers, similar to their African counterparts, a few handaxe like core-cleavers, recalling European forms, various types of side-scrapers, denticulates, notches, a **few** end-scrapers, etc. The most important technological features of the tool-kit were an extensive use of the Levallois technique and the occurrence of a good number of blades, detached from thoroughly prepared blade-cores. These features obviously point towards an advanced Acheulian industry.

15. Excavation at Aphsad, District Nawadah.— In continuation of the last year's work of the Directorate of Archaeology and Museums, Government of Bihar, under **the** General guidance of Sita Ram Roy, assisted by Parvez **Akhtar, Jamil** Akhtar, N.C. Ghosh and **Raghu-nath Prasad Verma, resumed excavation at Apsadh with** a view to exposing the entire brick **built Vishnu Temple built by Adityasena, a later Gupta King.**

During this season, only one **trench (APDH-5) was laid** out on the southern side of the **mound. The excavation revealed the lower most tier and** the offset - projection with its **ad-joining recess of the temple. Although the upper most** portion of **the** tier was found disturbed **by brick-robbers, the lower portion was found intact with the bricks joined by a thin layer of lime and *surkhi* mortar.**

Besides, a well preserved brick paved flooring (8 x 6 m) was also exposed. In the centre of the offset - projection, a rectangular levelled platform (0.85 m x 1.35 m) was noticed which seems to have been used as a prayer- platform. The bricks used in the structure measured 0.38 x 0.28 x 0.04 m. Except a few terracotta conical beads and N.B.P. sherds, there was no other significant find from the site.

16. Exploration in North Koel Valley, District Palamu.- Ajit Kumar Prasad of the Directorate of Archaeology and Museums, Government of Bihar, Patna, assisted by Lakshman Prasad Singh, Shri Uma Shankar Pandit, Parvez Akhtar, Nagendra Sharma, Sanjiv Ranjan, under the guidance of Sita Ram Roy explored the area between Daltongaj and Patthar Chatti, along with the bank of the River North-Koel in the district of Palamu. The exploration brought to light the following middle and Late Stone age sites.

Chianki.— The site was situated on the bank of the River North-Koel about 8 km south of Daltonganj, the district headquarters of Palamu. It yielded a ring stone and scrapers made on quartzite.

Bakhari.— It is located on the bank of the same river about 1 km south of Chianki. From the site were collected scrapers made on quartzite.

Patthar Chatti.— It is closed to the confluence of two rivers, namely Auranga and North-Koel, about 15 km south of Daltonganj. The site revealed the scrappers made on quartzite, cores of chert, blades of chalcedony and crystal.

17. Excavations at Manjhi, District Saran.— The Department of Ancient Indian History Culture and Archaeology of the Banaras Hindu University under the direction of T.N. Roy conducted excavation at Manjhi, a centrally protected site, situated on the left bank of Ghaghra in District Saran. The main objective of the excavation was to ascertain the extent of ancient habitation and the antiquity of the site. The main mound locally known as Manjhi-ka-Tila is nearly 14 m in height from the ground level. It has a rain-gully running south-north which on the southern extreme of the habitation towards the River Ghaghra gives an impression of an ancient opening. Excavation provided a sequence of cultures starting from pre-Buddhist times up to the medieval periods. Period I rested directly on the natural soil and in fact imperceptibly merged with it. It yielded black-and-red, black slipped and associated red wares. The types included bowls with everted and featureless rim, platters and dish-on-stand. An almost full dish-on-stand of black-and-red ware was noteworthy. No other antiquities were recovered from this period except pottery discs and a fragment of stone of indeterminate use. Iron was absent.

Period II (N.B.P.W. Period) started without any break of occupation from Period I, and was characterized by the introduction of N.B.P. and iron. It is possible to further sub-divide this N.B.P.W. Period into three Sub-periods, Early, Middle and Late. In red ware, Ahichchhatra type 10 A and miniature bowl made their appearance in Sub-period II B. In Sub-period II C, the dominant industry was coarse N.B.P. (Fabric E) but top graded N.B.P. (Fabric A) also continued. The introduction of carinated *handi* and incurved bowls was a noteworthy feature of this sub-period. The presence of baked brick structures (size of bricks being 50 x 25 x 9 cm) and ring **wells** were duly noted in sub-period II-C. Ascribable to the last stage of this sub-period and to the beginning of the next period was a massive clay fortification. It was observed to be directly constructed over the deposit of Sub-period II-C after levelling the ground. The antiquities recovered from the core of the defences were essentially the material from Sub-period II-A and II-B indicating that the defences could not be associated with Sub-periods **II-A** and **II-B.**

The other details, like its various stages of construction, vertical extant height, basal width and its relation with the stratigraphy of the habitation area still remains to be ascertained.

From the Early Phase of N.B.P. i.e. Sub-period II-A, mention may be made of large number of finished and unfinished bone tools, two stone sharpeners , a copper bangle and a finished object of iron of indeterminate use. In the Middle Phase of N.B.P. i.e. Sub-period II-B, better finished objects of bone and ivory like arrow-beads and styluses alongwith a terracotta block of indeterminate use were noteworthy. Among the antiquities of the Late Phase of N.B.P. i.e. Sub-period II-C, mention may be made of a punch-marked coin, large number of bone points; single perforated discs of N.B.P.; terracotta cones, balls and wheels of terracotta; bangles of glass, copper and iron objects; a decorated terracotta figurine of a horse and a stone casket with a lid. Two inscribed sealings of terracotta which on the basis of palaeography could be assigned to 1st centuries BC/AD are also noteworthy finds of this sub-period. Period III started with no appreciable time gap between the end of Period II and the beginning of Period III. The cultural equipment of this period showed marked contrast to that of the preceding one. The coarse **N.B.P. of sub-period II-C** with its characteristic shapes like, bowls, dishes, carinated *handis* and lipped bowls, etc. was also no more to be seen now. Among the most important types of this period in red ware industry, mention may be made of bowls with incurved rim, ink-pot lids, bottom-knobbed lids, spouted basins and bottle-necked sprinklers. Baked brick structures ascribable to two structural phases were noticed. While complete plan was out of question because of limited area excavated, both in MJH-1 and MJH-2, several walls were noted in which the size of baked bricks were not at all uniform. In this connection particular mention may be made of a structural complex lined with gravels which, however, could not be completely traced.

This period yielded largest number of antiquities. Mention may be made of large number of terracotta human figurines, both male and female; terracotta animal figurines including horse, monkey and camel; stone and terracotta pestles, and stoppers, gamesmen, ear-ornaments, pendant, wheel and decorated discs of terracotta. A decorated scale of ivory from the early deposit of this period is also noteworthy. An inscribed terracotta sealing which on the basis of palaeography can be assigned to 2nd-3rd centuries AD was an important find of this

Period IV came at the site after a considerable lapse of time, the deposits of which were noticed in a very limited area. The pots were decorated with stamped, incised and applique designs. Among the noteworthy types in red ware mention may be made of knife-edged bowls, carinated *handis* with soot marks, knobbed lids, sturdy basins and shallow plates. Apart from the ordinary red ware, a few pieces of the glazed ware were also reported mainly from the late levels of the site.

GOA, DAMAN AND DIU

18. Excavation at Velha Goa.— R.G. Pandey of south-western Circle of the Survey assisted by T.M. Keshava, D.L. Sirideshpande and G.L. Gaikawad conducted a small scale

excavation in the vicinity of Adilshahi Palace Gate with a view to establishing the relationship between the previously exposed structures and the gate.

Two rectangular halls with platforms and a room were exposed in the excavation. The platforms appeared to be a later addition. There were two phases of construction. The first phase was of dressed stone slabs and laterite dressed stones, plastered with lime while the second phase was of rubble masonry with mud mortar. The pottery from the lowest levels comprised of celadon ware, and coarse red and black ware. The types included jars, *handi,* sprinkler and spouted pots. It also yielded a half disc of copper and a coin with Persian legend of Adilshahi times. (?) Antiquities obtained from the upper levels were porcelain ware, blue painted, hexagonal and rectangular floor tiles (porcelain coated), a small iron star and a gold droplet.

GUJARAT

19. Exploration in District Amereli, Banaskantha, Bhavnager, Jamnagar,Junagadh,Kach-chh, Mahesana, Rajkot and Valsad.— The Department of Archaeology, Government of Gujarat, conducted exploration in the above mentioned districts and brought to light the following Sites:

District	**Village/Site**	**Cultural Assemblage**
Amreli	Dadava (Randal)	Harappan
Banaskantha	Gong Maharaja Palo-Dasa-navas	Medieval
-do-	Vasana	Medieval
Bhavnagar	Timbo of Shalana	Early Historical
Jamnagar	Old Darbargadh	Late Medieval
Jun-agadh	Dhanfuliya	Early Historical
Kachchh	Baranda	Megalithic
-do-	Bhutakiya	Microlithic
-do-	Gedi	Megalithic
-do-	Guneri	Medieval
-do-	Haroda	Medieval
-do-	Meghmedi	Megalithic
Mahesana	Ambod	Pre-Solanki Period
-do-	Choki Lakroda	Late Medieval
-do-	Dhamanva	Medieval
-do-	Fichadi	Medieval
-do-	Hemaranu Deru, Lakroda	Late Medieval
-do-	Jantral	Medieval
-do-	Jogeshwar, Mahadeva, Davada	Solanki Period

District	Village/Site	Cultural Assemblage
Mahesana	Khadat	Medieval
-do-	Korada	Medieval
-do-	Kuvadara	Medieval
-do-	Nandan	Pre-Solanki Period
-do-	Surpura	Medieval
-do-	Timbo of Dhudeshwar Mahadeva — Suraj	Medieval
-do--	Timbo of Fuluath Mahadeva Fuletra	Medieval
-do-	Valam	Pre-Solanki and Solanki Period
	Madan Kundala Gondal	Harappan

20. Excavation at Nageshwar, District Jamnagar,— K.T.M. Hegde of the Department of Archaeology and Ancient History, M.S. University of Baroda, assisted by V.H. Sonawane.K.K. Bhan, K. Krishnan and Ajit Prasad, conducted excavation at Negeshwar (22°20' N. and 69° 03' E), 17 km north-east of Dwarka in Ckhamandal Taluka. The site is situated on the northeastern edge of a large, 12 km perennial sweet water lake, 8 km south of the Poshitra Bay coast and 6 km west of the Pindara Bay coast in the Gulf of Kutch. Proximity of the two bays, both rich in *Turbinella pyrum* commonly known as chank or conch shell and *Chicoreus ramosus* gastropods, raw materials for manufacturing shell ornaments, ladles and spoons, availability of sweet water in an area where the sub-soil water is brackish, a narrow margin of land all around the lake where the soil mantle above the local limestone bedrock is sufficiently thick and fertile for agricultural operation and the thick growth of tall, tubular, aquatic plants within the lake, locally known as Baru, S. *orghum Balepensis* believed to be suitable for building small sea-going vessels, appear to have attracted an early Harappan community to Nageshwar.

Unfortunately, the Harappan mound measuring 120 x 100 m was systematically destroyed in 1976 by local earthwork contractors who dug up regular rectangular pits, leaving 6 to 10m wide baulks for collecting earth to build an embankment around the lake to augment the accumulation of monsoon run off flowing into it. However, this destruction of the site revealed a 2 m thick habitation deposit of Harappan Culture, stone rubble structures nearly all varieties of Harappan pottery of the mature phase including the reserved slip ware, fine quality grey ware, dish-on-stand in the red ware containing the typical internal incised decorative design of radiating strokes in concentric circles. But there was no evidence of the black-and-red ware of Lothal or the lustrous red ware of Rangpur II-C, or the white-painted black-and-red ware encountered at Desalpur and in Surkotada I-C or, except for a stray sherd, the stud-handled bowl, the type fossil of the Harappan levels in Saurashtra. It appeared that the ceramic evidence at Nageshwar presented certain special characteristics which needed further investiga-

tion. Also, the whole site, with assurance, could be assigned an industrial function from the evidence provided by the spread of thousands of fragments of gastropods, fragments of shell bangles and ladles. This appears to be the first Harappan site in India to exhibit such an excellent evidence of an industry based on marine shells which necessitated excavation.

Four undisturbed areas in the mound were selected for excavation.

Period I A is represented by an occupational deposit of 0.70 to 1.20 m, which yielded well-baked pottery types of the mature Harappan phase (Fig: 1), while Period I B was marked by an occupational deposit of 1.30 to 1.40 meters having structures made of stone-slab-paved floors and rubble walls. Both sub-periods I A and I B, however, showed cultural continuity. The ceramic evidence of the latter is characterized by simpler geometric decorative designs, absence of floral motifs and coarse fabric (Fig. 2). Another noteworthy feature of the period is the discovery of a fire altar (Fig. 3).

Important antiquities comprised a huge quantity of conch shell fragments, a heap consisting of 413 *Turbinella pyrum* collumella, perhaps specially collected for making cylindrical pendants, fragments of shell bangles also having incised chevron motif, broken ladles made of *chicoreus ramosus* gastropods, shell pendants, beads and small triangular and square pieces perhaps intended to be used as decorative inlays on wooden furniture, doorways or doors. Other finds recovered from the excavation included cubical weights of agate, pinched terracotta lumps triangular and spherical in shape, terracotta bangle fragments, terracotta toy-cart frame; ornamental beads of carnelian, faience, steatite and terracotta; chert blades and cores and a folded sheet of copper. Besides, number of special type querns with small circular depressions, perhaps meant for polishing cut shell circles to turn them into smooth bangles have been reported. A preliminary study of the faunal remains noticed here in the excavation would indicate their knowledge of domestication of animals like cow, goat, sheep and buffalo, wild animals like nilgai, antelope, spotted deer, sambar and marine fish.

21. Exploration in Districts Mahesana, Panchmahals, Rajkot and Vadodara.— The Department of Archaeology, Government of Gujarat explored the districts of Mahesana, Panchmahals, Rajkot and Vadodara and discovered forty-one sculptures and temple remains ranging in date between eight to eighteenth century AD.

22. **Excavation at Rojdi,** District **Rajkot.—** The Gujarat state Department of Archaeo logy in co-operation with a team from the University Museum, University of Pennsylavania continued their excavations at Rojdi, a site of the post-urban phase of the Harappan Civilization (IAR 1982-83, Page 28). Horizontal excavations on the south extension of the site revealed a major architectural level dating to the middle of the second millennium BC (pl. 15). The exposure brought to light rubble foundations of structures, one of which is triangular in shape. Pottery similar to Rangpur II B/C was found. Work on a large square building of the post-urban phase on the northern end of the site continued. Evidence for a wall surrounding the site during Harappan times was also gathered.

Small finds included copper/bronze tools and ornaments, beads of various stone and

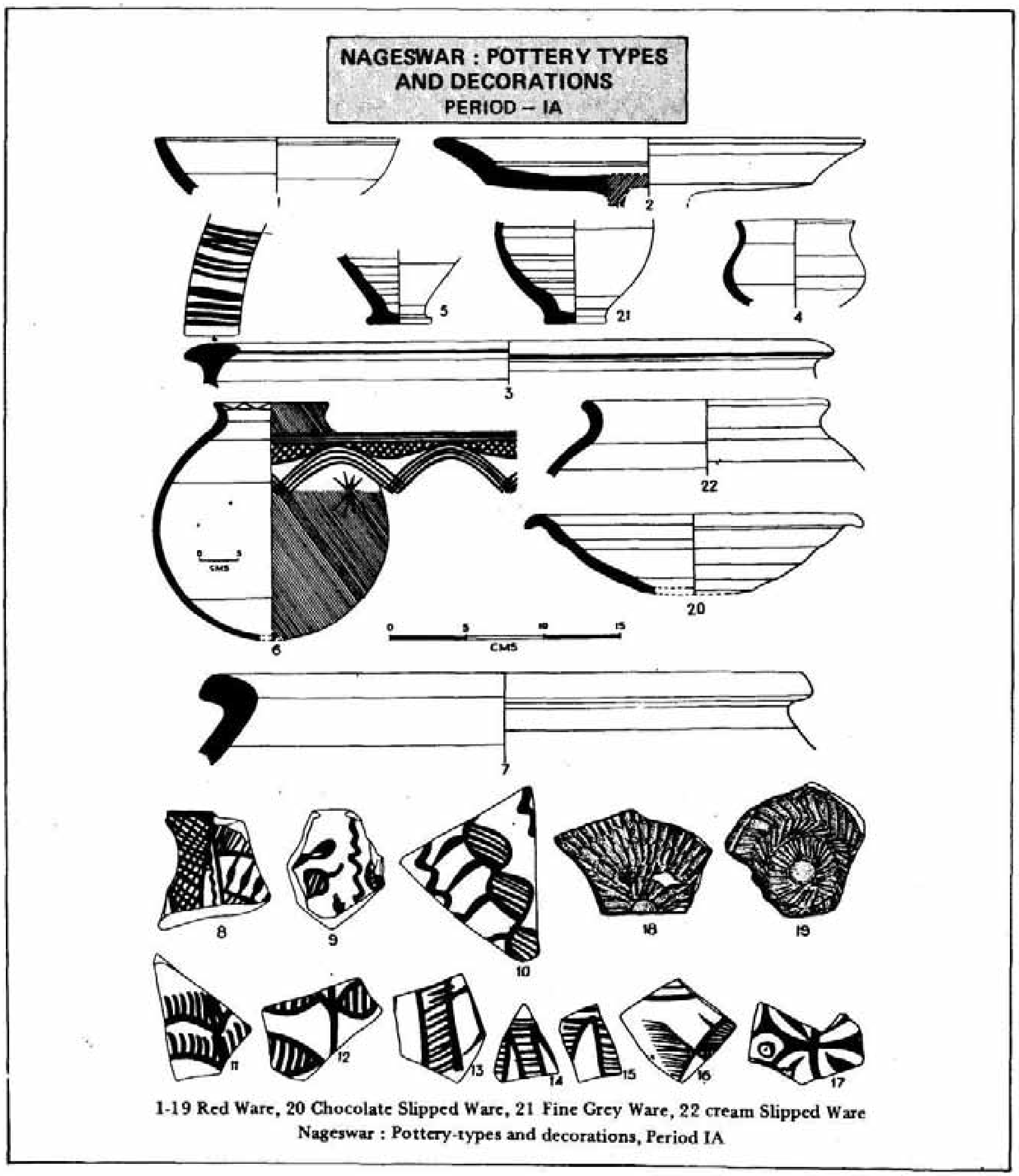


Fig. 1. Nageswar : Pottery types and decorations, Period IA.



Nageswar : Pottery-types and decorations, Period IB 1 -7 Red Ware, 8-9 Chocolate Slipped Ware, 10-12 Cream Slipped Ware, 13-14 Reserved Slip Ware

Fig. 2. Nageswar: Pottery types and decorations, Period IB.

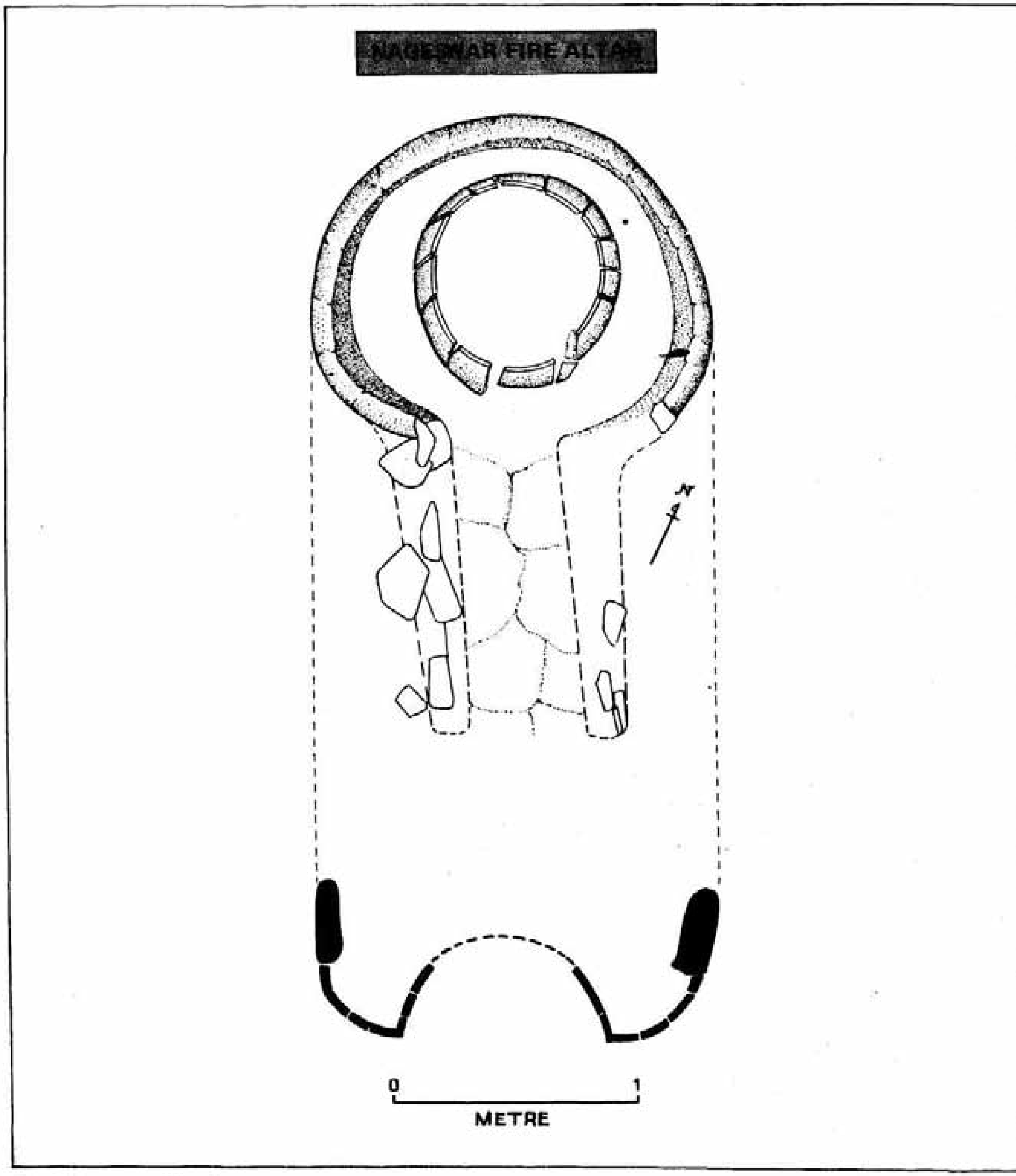


Fig. 5. Nageswar : Fire altar

Pottery (pls. 16 & 17). The absence of seals and Indus script is noteworthy, however, graffiti on pottery was abundant.

23. Exploration in District Vadodara.— During the course of exploration, Narayan Vyas of the western circle of the survey, brought to light the following sites:

Taluk	**Village/Site**	**Cultural Assemblage**
1. Vaghodia	Dharola	Brick Structures, pottery of historical period, medieval sculptures and ancient tank
2. -do-	Dolapura	Microliths
3. -do-	Muai-Ashram	Microliths
4. –do-	Vankua	Medieval sculptures

24. Excavation at Goraj (Mahadeopura), District Vadodara.— In continuation of the last year's work, (1982-83 p. 31), B.M. Pande assisted by Narayan Vyas, M.D. Puranik, N.A. Sai-yed, S.R. Shah, S. Sarangdharam of the Western circle of the Survey and Padmaja Ramachan-dran and Kuldip Bhan, research scholars of Maharaja Sayajirao University, resumed excavation at Goraj with a view to exposing the plinth of the brick temple partly unearthed earlier.

Excavation was taken up on the east, north and south of the mound to expose the structure, which was found in a damaged condition due to brick robbing on the northern side. Patches of lime plaster were also traced on the western side on the outer lower portion of the moulding *(Kalasa).*

The plinth of the temple was encountered after removing the natural soil down to about 40 to 60 cms from the rammed floor level. There were four courses of bricks below the ground level. The plinth of the temple was made of moulded burnt bricks some of which bear simple decoration. The upper two courses of decorated bricks were triangular in shape, below which occurred *kalasa, antara-patta, kumbhaka* and *khura* mouldings. The *antara-patta* was half-octagonal in shape and decorated with floral motifs. A number of open stone drains *(pranala)* supported by bricks were traced on the north, west and south sides on the plinth, some of which have a brick covering. Of these, one *parnala* in three segments was larger than the rest. One of this *pranala* contained a simple decoration and was oriented north-south with its mouth to the north discharging into a brick-built *kund* consisting of thirty-six courses. In all likelihood this formed a part of a large temple, dedicated to Siva (pls. 18 & 19). One of the dislodged portions of the *pranala in situ* was exposed near the plinth of the modern Siva temple which was probably built in the nineteenth century.

' On the northern side of the plinth where the largest *pranala* was exposed, an additional brick paved floor was noticed. This was perhaps built as a support to the other portion of the plinth, the upper portion of which was unearthed in the excavation.

The pottery recovered was plain red, micaceous red and buff wares, fragments of hand-

made storage jar and a few sherds of Red Polished ware. Other finds from the excavation included terracotta bead, different types of bangles of copper and other objects, terracotta human figure and a broken stone plaque showing Ganesa. Two images, one of standing Parvati and the other fragmentary figure of Vishnu were also found from the late levels. Iron nails were also recovered from the excavation similar to those found at Devnimori.

On the basis of the brick-size, pottery, terracotta bead, iron and copper objects, etc. the site could be dated to the period from second-third century AD to fourteenth-fifteenth century AD.

HARYANA

25. Excavation at Banawali, District Hissar.— (Fig. 4) In continuation to the previous work undertaken by the Department of Archaeology and Museum, Haryana, during 1974-77, R.S. Bisht, of the North-western circle, Srinagar, of the Survey with the assistance of J.M. Thapar, G.S. Gaur, K.C. Nauriyal, Ashok Patel, R.N. Kaw, Balbir Singh, T. K Ganjoo, C.L. Malla and Jasmer Singh, further excavated the site. The present work, besides imparting training to the students of the School of Archaeology of the Survey, envisaged: (i) to study the evolutionary stages of the pre-Indus and Indus cultures, including an examination of the prospect of a transitional phase between the two; (ii) to probe for pre-Indus defences, if any; (iii) to determine the configuration of the defences as well as the inner layout of the Indus settlement; (iv) to understand the sequential growth as well as the antecedents, if any, of the bipartite wall; (v) to decide both the extent and structural phases of the Post-Indus habitation as well as its stratigraphic relationship with the preceding period; and, (vi) to expose one house-complex of each period.

Period I. Pre-Indus Culture.

The remains of Period I were excavated at four places to the natural soil. The well-documented evidence came from Tr. OC3 (alpha) which revealed a continuous succession of structures associated with occupational strata. The first stage was denoted by the first two structural phases related to a 0.60 to 0.80 m thick deposit overlying the brownish yellow soil. The next stage began with the introduction of a fortification, delimiting the habitation. It was represented by an 1.60 m thick cultural debris which coincided with the first two building phases of the defensive wall and residential structures of as many phases.

Of the bricks, in addition to the usual forms of the familiar ratio of 1:2:3, square examples, measuring 30 x 30 x 10 cm, 27 x 27 x 9 cm, 24 x 24 x 10 cm, were also noticed. Houses were found well-provided with mud-floors, tandoors, smaller ovens, hearths large circular com-silos and smaller pits (pl. 20), both clay-lined and plain. The house-walls were normally made of single bricks, though there were a few exceptions as well.

The fortified settlement of Period I appears to be oriented oblique to the cardinal direc-

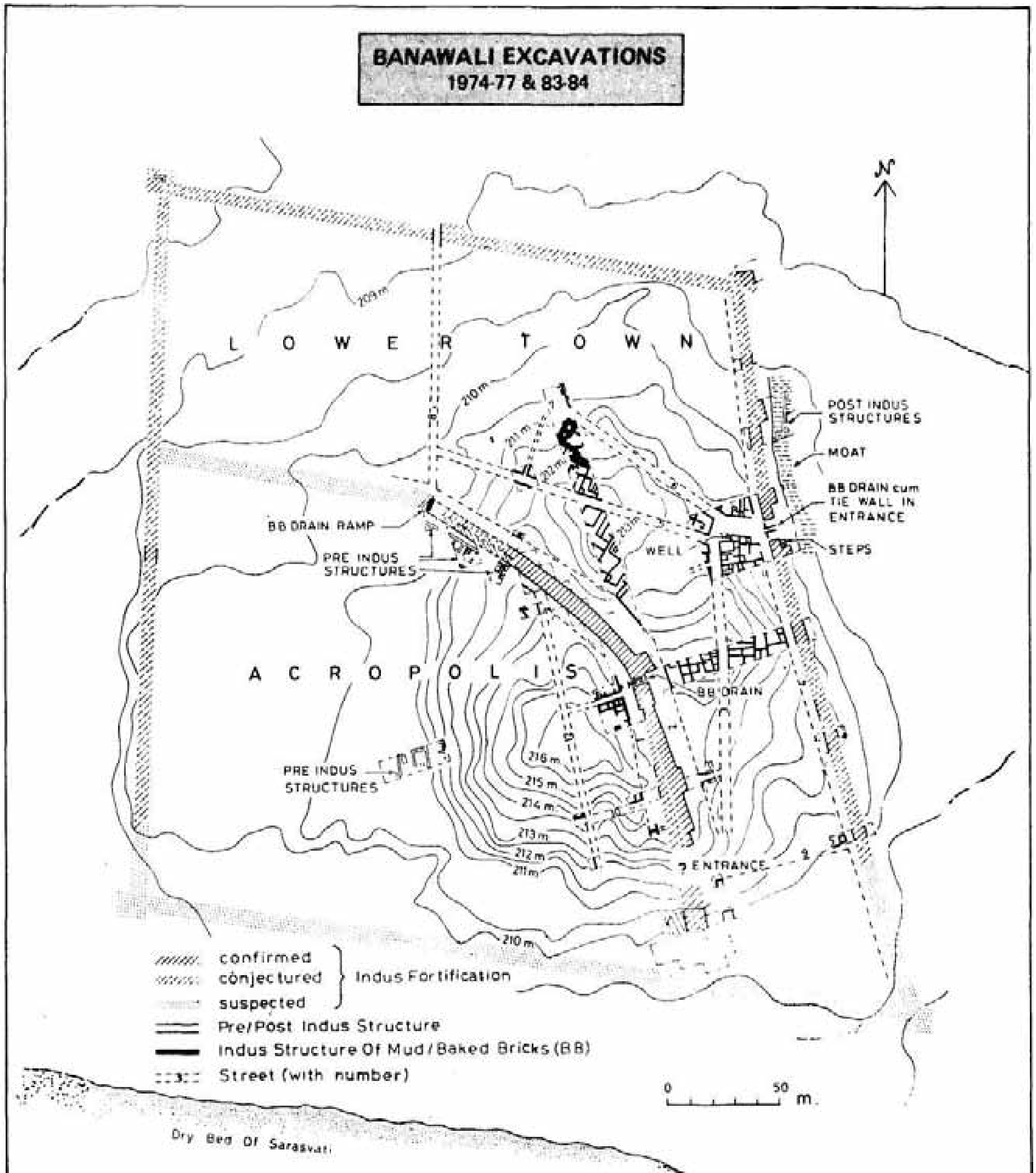


Fig. 4. Banawali : Site plan showing excavated structures etc.

tions. The wall exposed in Tr OC, which runs roughly along NW-SE should represent the north-eastern arm of the fortification. At far south, beside the Indus bipartite wall, a massive mud-brick structure delimiting the Pre-Indus deposit was exposed. It is likely to be a part of yet another, i.e, the south-eastern arm oriented somewhat along SW-NE. This wall must be lying half-way through under the lower town of the following period. The presence of the Pre-Indus strata in the lower town area, exposed further north, lends credence to it and also confirms the earlier surmise that, at least, the north-eastern part of the Pre-Indus settlement might not have been appropriated by the Harappans for their acropolis. Towards the southwest, the wall was found completely destroyed during the Post-Indus period.

Period II. Indus Culture.

Succeeding the transitional phase with rather stratigraphic conformity and cultural continuity, Period II made its beginning with its unique town-planning which, besides appropriating, perhaps the entire antecedent settlement, extended its area nearly twice as large.

The cutting at ZC6 which was 0.85 m lower than the highest point of the mound has revealed a 4.32 m thick Indus deposit conformably overlying that of Period I. It has been noticed that the Harappans maintained their planning throughout vertically too. It also manifested that the pre-Indus pottery tradition, albeit with some degree of adaptation, persisted all through as a companion ware during Period II, while the mature Harappan ceramics and antiquities went on increasing steadily up to the mid-level from where further on to the top they bloomed in both abundance and variety.

Amongst the antiquities, the pride of place goes, of course, to a clay model of a plough which appears to be a genuine prototype (pl. 21). It is a combined form of the beam and shoe. The beam is curved like an inverted 'S' with a hole at the top end. The point of the shoe is pointed sharply. Its extended hind portion is pierced through with a vertical hole to receive a curved or vertical handle. In addition, a few broken pieces of plough were also collected. Another important find is a small fragment of black stele which is engraved with human figures of a male and a female engaged in an acrobatic exercise (pl. 22). The figures delineated in linear and triangular style recalls those found engraved on a terracotta cake from Kalibangan.

The outer defences were sounded at several points on the north, east and west, while the southern arm together with both the corners remained indeterminate. The north-western and north-eastern corner bastions were substantiated in restricted digs. It *inter alia* decided the corner-to-corner run of the northern wall to be 275 m long. Additionally, it was spotted in the cut of an irrigation canal somewhere near the centre. There was noted a narrow gap, probably of a postern entrance, pierced through the wall augmented by a bastion from the east. From there, perhaps, emanated a street running south, as the debris cut through by the canal for quite a long stretch yielded no structures. On the other side, the western wall was determined by surface clearance to a length of 175 m to which might be added another 120 m, as the ground indications suggest. Of the eastern arm, the exposed length was increased from 100 m to 260 m, though its southward continuation remained untraced.

A unique feature of planning, hitherto not reported from any of the Indus sites bearing defence work, was the exposition of a deep and wide moat outside the town-wall and a broad berm in between the two. The depth and width of the moat could be ascertained to be 3.30 m and 6 m, respectively, while both indicated further continuation. Its length along the wall was determined, so far, for a stretch of 75 m. The berm which has also revealed periodical raising all throughout was found to be 3.50 m to 4 m in width.

Another significant contribution may be the uncovering of an elaborate gate-complex provided somewhere north of the centre of the Eastern wall (pl. 23). The complex was provided with the frontal moat, flanking bastions and a 8 m wide passage built in with a large longitudinal drain, a latitudinal tie-wall and a flight of steps leading to the southern bastion. The drain and the tie-wall are made of fired bricks and revealed two phases of construction (pl. 24). Both of them might have laid under a ramp or a flight of steps in order to provide an access to the town. The available evidence is not very clear. Anyway, the drain divides the entranceway into two nearly equal halves of which the southern one was found packed with clay and mud bricks, and the other had been completely destroyed by the gushing storm-water to a considerable depth which yet remains to be fully ascertained.

With regard to the bipartite wall, very useful information was gathered from four trenches sunk on either side in addition to trial probings made in the south. It is pertinent to mention here that this wall fortified the Indus acropolis alongside dividing the entire settlement into two halves. Starting from south, its eastern arm, now established for a length of 118 m, runs 68 m apart, parallel to the corresponding wall of the outer defences up to half the length of the town roughly along the N-S. Then it turns towards north-west in a large curve which has been traced to a length of 125 m. Beyond that, over a stretch of 120 m along E-W, up to the outer defensive wall, it still remains untapped. It is not certain whether it joined the former at last. On south, 35 m more were added to its length, but further on, at least along 20 m, the wall was found completely removed by the Post-Harappans.

Curiously, of the east wall, over 70 m of the northern portion exhibited progressive widening till it started reducing its breadth with the aid of offsets from the outside. There is a strong likelihood of a broad gateway in the proximity as the surface features reveal. In another dig beside the east arm the remaining part of a bastion was fully laid bare.

The radial or semi-radial system of streets was brought to bolder relief. Two streets in the acropolis and three in the lower town were added to the previously known group of seven. In addition, two lanes were traced in the latter area.

Furthermore, Banawali has produced certain interesting terracotta models of wheel, both spoked and solid, known to the Vedic Aryans as 'Sara chakra' and ‘pradhi chakra' respectively. One specimen clearly shows simulation of spokes shown in low relief. Earlier, a few examples have shown the spokes painted with black or white lines. There were also recovered nine seals (pls. 25 & 26) and two sealings (pl. 27). Sealings are found on clay lumps. One example bears part impressions of two different seals. The other usual classical items have been found in a large number. However, mention may also be made of more finds of the figurines of Mother Goddess, pieces of gold ornaments, beads of lapis lazuli, the etched carnelian as well as

glazed beads and fragments of a clay crucible.

Period III. Post Indus.-

Period III is represented by three building phases through 0.50 m occupational deposit which overlies the filling of the Indus moat, which too is finally sealed by a layer of erosion. A period of long desertion of the site before the arrival of the Post-Harappans is, therefore, evident.

The main habitation lies outside but close to the east town-wall of Period II. At places, traces of pile walls associated with working levels, fire places, storage and refuge pits were found resting right upon the Indus remains.

All the structures of this period were made of packed clay. Use of bricks seems to have gone out of vogue. The walls were oriented along the cardinal directions and betray fine workmanship. While well-layered deposits outside the houses yielded a good number of pottery and other items, the interior of the same are normally devoid of the rubbish — a feature noticeable at Bara, Sanghol, Chandigarh, Daulatpur and other places as well. It possibly accounts for an usually great number of refuge pits dug up by the Post-Harappans all over at Banawali and elsewhere.

The ceramics are the familiar assemblage closely related to that from Bara, Sanghol IB and Mithathal II B. Most of the usual shapes, painted motifs and other traditions of surface-decoration were duly met with. Mention may, however, be made of a bichrome chocolate ware decorated with simpler paintings done in deeper tones of chocolate colour of both lighter and deeper tones. The field between the painted bands or motifs, are filled in with white mixed with a little amount of greenish blue pigment. This ware has been usually used for medium sized vessels with globular body and a thick deep undercut rim. The classical Indus shapes, decoration, and largely the fabrics too are conspicuous by their absence.

The antiquities are very few in number and variety. All the classical items of period II are totally absent, save for the crude terracotta nodules of different shapes and sizes. The terracotta cakes are missing altogether. Instead, small triangular objects made out of pottery or directly of clay were found in large numbers. Besides, fragments of two animal figurines, most plausibly of bull, made in a highly individualistic style were recovered. Both show a vertical hole pierced through the body just behind the forelegs.

The most significant antiquity of the period is a black terracotta object (Fig.5) of which only three fragments were found. It has a flat square base with pronounced concavity on all four sides. Following the plan its curved body conformably rises to sides which finally terminate into snake-hook-like projections of which only two were recovered in somewhat damaged condition. While one side remains wide open all through except at the base and the top, the other is decorated with incised pattern. The central portion of the top is damaged beyond restoration.

26. Excavation at Balu, District Jind.- The Department of Ancient Indian History

Culture and Archaeology, Kurukshetra University, under the supervision and guidance of U.V. Singh and Suraj Bhan, along with S.B. Singh and S.P. Shukla, resumed excavation with a view to finding out more details about the Harappan fortification wall. Twenty-two trenches were laid. The digging in the centre of the mound on the top revealed the northward extension of the fortification wall. The western part of the central wall of the fortification was exposed to a height of 3 meters in trench EX-3. The north-eastern corner of the fortification was exposed in KX-7 where the wall is preserved to a height of 17 cm only. It comprised seven courses of mud bricks of different sizes. The common brick size was 10 x 20 x 40 cms. But some of the bricks differed from the typical Harappan ratio. The trenches in the south of the mound revealed the outer corner of the fortification wall in B-13-14 and C-13 and 14 which was partly damaged by the erosion. The LateHarappan kilns, ovens, mud or mud brick structures were found in the debris deposited over the eroded fortification wall. On the eastern slope of the mound the excavation brought to light a complex of house walls separated from the fortification wall by a north-south street. Another street running in east-west direction was traced in one of the recesses of the fortification wall. The eastern fortification wall is preserved to a maximum height of nine courses. The structures, partly exposed along the streets were constructed of mud bricks of typical Harappan sizes. Two phases of structures corresponding to two levels of the street were noticed in the eastern sector. The streets varied in width from 1.45 m to 1.90 m. The excavation revealed a clear break between the pre-Harappan, Harappan and Late Harappan occupations at the site. Among the Harappan antiquities collected, mention may be made of grinding stones, pestles, terracotta triangular cakes, copper arrow heads, terracotta bangles and beads, steatite.

27. Exploration in District Sirsa.— In continuation of the previous work (1980-81 pp. 16-21) Dhoop Singh and Chanderpal Singh of the Department of Archaeology and Museums, Haryana, discovered the following sites in the course of village to village survey in District Sirsa. The explored sites along with their cultural assemblage were as under:

District	**Village/Site**	**Cultural Assemblage**
Sirsa	Banwala	Rang Mahal
-do-	Bhagsar	Medieval
-do-	Chakjalu	Early Historical
-do-	Chakrian	Rang Mahal
-do-	Chormarkhere	Rang Mahal
-do-	Bangala	Rang Mahal
-do-	Bangoo	Rang Mahal
-do-	Ban Sudhar	Medieval
-do-	Baru Wali	Rang Mahal
-do-	Bazigar	Medieval
-do-	Biruwale-Gudhe	Medieval

District	Village /Site	Cultural Assemblage
Sirsa	Brasari	Early Historical
-do-	Budhimari	Rang Mahal
-do-	Burtawale	Rang Mahal
-do-	Chahawala	Medieval
-do-	Chakriyen	Early Historical
-do-	Chak-Sahibe	Early Historical
-do-	Chamal	Medieval
-do-	Chatrian	Medieval
-do-	Chuburja	Medieval
-do-	Dabraklan	Medieval
-do-	Dayaram-Dhani	Rang Mahal
-do-	Desu	Medieval
-do-	Dhamora Cheri	Medieval
-do-	Dhani Bhaganwali	Early Historical
-do-	Dhafar	Early Historical
-do-	Ding Mandi	Rang Mahal
-do-	Diwana Khera	Rang Mahal
-do-	Dukre	Early Historical
-do-	Fakir Wali Theri	Medieval
-do-	Firozabad	Medieval
-do-	Gadi	Rang Mahal
-do-	Ghoranwali	Medieval
-do-	Goriwala	Rang Mahal
-do-	Jalam-Khera	Rang Mahal
-do-	Jogewala	Medieval
-do-	KalaWali	Rang Mahal
-do-	Khav Wali	Rang Mahal
-do-	Lakhvana	Rang Mahal
-do-	Maina Khera	Medieval
-do-	Malki Pur	Rang Mahal
-do-	Mithui	Medieval
-do-	Munawali	Early Historical
-do-	old a Panni walehose	Medieval
-do-	Pipli	Medieval
-do-	Rampure Bishna-ian	Medieval
-do-	Ratta Khera	Rang Mahal
-do-	Rishalia-Khera	Rang Mahal
-do-	Rohar Wali	Rang Mahal
-do-	Sarvant Khera	Rang Mahal

District	Village/Site	Cultural Assemblage
Sirsa	Alipur-Titu Khera	Medieval
-do--	Allanor	Medieval
do--	Badha-Gudha	Medieval
do--	Bahu deen	Rang Mahal, Medieval
do--	Bajekhan	Medieval
do--	Bakri Wali	Early Historical, Medieval
do-d	Ghusiana	Medieval
o--d	Gidrenwali	Rang Mahal
o--d	Gudiakhera	Early Historical, Medieval
o--d	Harnai-a-Khurad	Rang Mahal
o--d	Harzira	Medieval
o--d	Havoli	Rang Mahal
o--d	Humanian Khera	Medieval
o--d	Jagmalara	Rang Mahal
o--d	Jamal	Medieval
o--d	Jiwannagar	Rang Mahal
o-	Jodhakan	Harappan, Painted Grey ware and Rang Mahal
-do-	Jodhar Rohi	Rang Mahal
-do-	Jodian	Medieval
-do-	Jogi Wale	Early Historical. Medieval
-do-	Kagdana	Medieval
-do-	Kamal Pakha	Rang Mahal
-do-	Kanwar Sahib Ka Dera	Medieval
-do-	Karamagarh	Medieval
-do-	Kari Wali	Rang Mahal
-do-	Keshopura	Rang Mahal
-do-	Kewal	Rang Mahal
-do-	Kheri	Medieval
-do-	Khumbhathala	Rang Mahal
-do-	Kirarkot	Early Historical
-do-	Kishanpura	Rang Mahal
-do-	Kotli	Rang Mahal
-do-	Kumahanian	Medieval
-do-	Kussambi	Rang Mahal
-do-	Kutiane	Early Historical, Medieval
-do-	Kuttabad	Rang Mahal
-do-	Takarwali	Rang Mahal
-do-	Livalwali	Rang Mahal

District	Village/Site	Cultural Assemblage
Sirsa	Ludehar	Medieval
-do-	Madho Singhana	Rang Mahal, Medieval
-do-	Makhla-Soran	Early Historical, Medieval
-do-	Malekhan	Rang Mahal
-do-	Manak-Dewan	Medieval
-do-	Mirpur	Rang Mahal
-do-	Mirzapur Theh	Medieval
-do-	Mithanpura	Rang Mahal
-do-	Mithisunera	Rang Mahal
-do-	Molhi Wali	Rang Mahal
-do-	Mohamad Purie	Medieval
-do-	Mohansinghwala	Medieval
-do-	Nagudin	Medieval
-do-	Mori Wala	Rang Mahal, Medieval
-do-	Mozukhera Purana	Rang Mahal
-do-	Nahra Wali	Early Historical
-do-	Nariankhera	Late Harappan, Rang Mahal
-do-	Nathurakivlan	Medieval
-do-	Nathukari Khurad	Medieval
-do-	Nigrana	Rang Mahal
-do-	Nimala	Rang Mahal
-do-	Birban	Rang Mahal, Medieval
-do-	Ottu	Rang Mahal
-do-	Phagoo	Medieval
-do-	Potlidabar	Rang Mahal
-do-	Raipur	Medieval
-do-	Rampur	Medieval
-do-	Rampura Dhillon	Early Historical
-do-	**Randhwe**	Medieval
-do-	**Range**	Medieval
-do-	**Rania**	Rang Mahal
-do-	**Ranjitpur**	Medieval
-do-	Rupara Bishnoian	Medieval
-do-	Rasulpur	Rang Mahal
-do-	Ratta Khera	Rang Mahal
-do-	Sabuwali	Rang Mahal
-do-	Shahpuria	Medieval
-do-	**Shikhu** Khera	Medieval
-do-	Sikanderpur	Rang Mahal Medieval

District	Village/Site	Cultural Assemblage
Sirsa	Sirsa	Medieval
-do--	Sukarmandori	Medieval
do--	Takthmal	Rang Mahal
do--	Talwara Khunad	Rang Mahal
do--	Tarkan Wali	Medieval
do--	Taruana	Medieval
do-	Thiraj	Rang Mahal

HIMACHAL PRADESH

28. Exploration in District Kangra.— In the course of village to village survey in Nurpur Tehsil of District Kangra along the Buhi, Fatehpur Dehra Khud rivers and other seasonal hilly torrents, A.K. Patel of the North-western Circle of the Survey discovered the following sites yielding remains of medieval and Late medieval times.

Village/Site	Cultural Assemblage
Batuhi	Late Medieval
Bali	Late Medieval
Diana (Dhaula Dev	Two Late Medieval sculptures of ninth-tenth - century and Late
Temple)	Medieval pottery
Dunara	Late Medieval
Kutheshr	Late Medieval *baolis* and some sculptures
Mastgarh	Late Medieval watch tower
Pathiar (Sanda Ka Talab)	Late Medieval tank and remains of stone structures
Solda	Medieval coins, temples, tank and pottery

JAMMU & KASHMIR

29. Exploration District Baramula.- In continuation of earlier explorations in the Jhe-lum Valley/gorge in Uri Taluk , S.M. Jaiswal and R.K. Datta of the North-western Circle of the Survey discovered the following sites:—

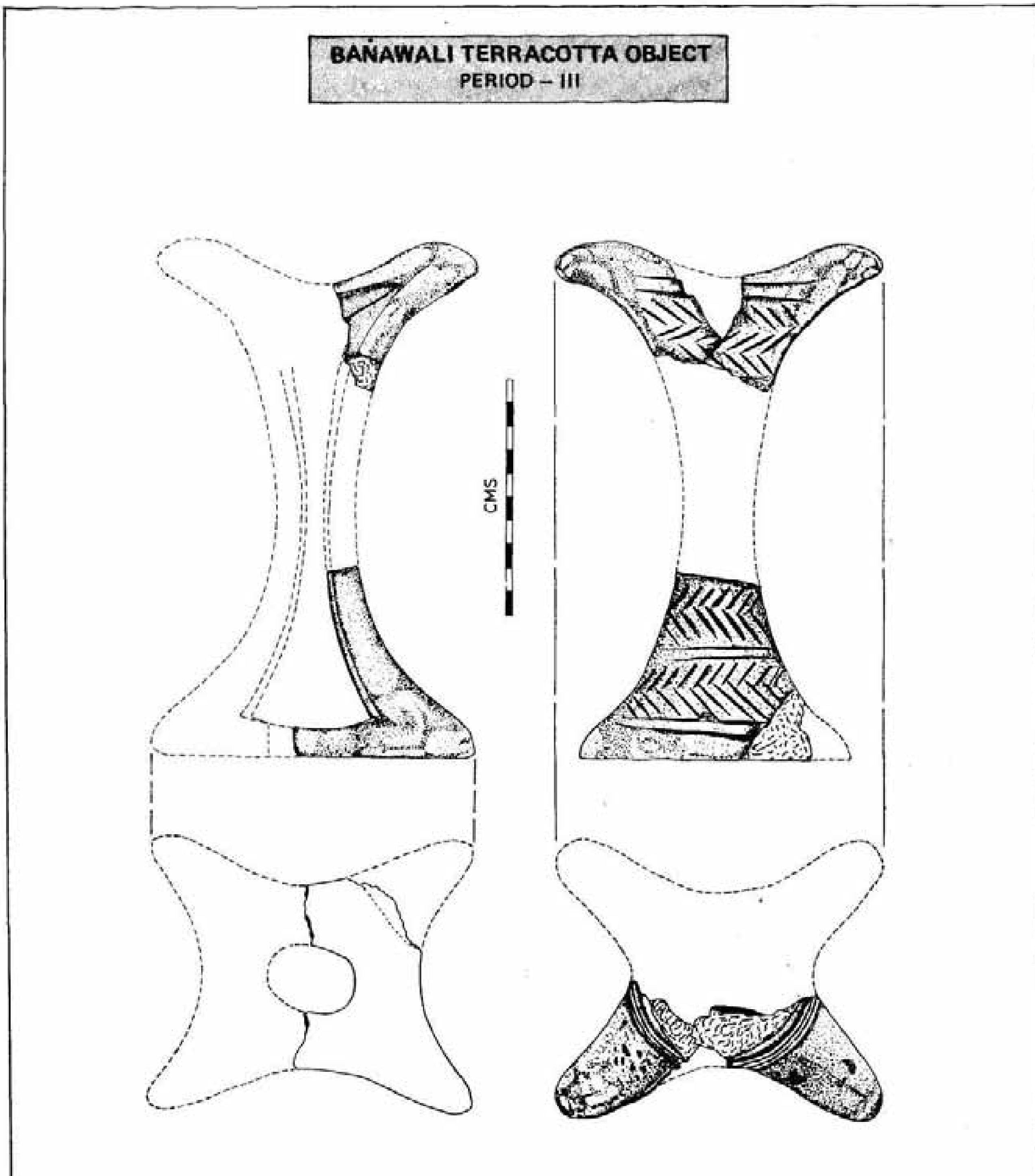


Fig. 5. Banawali : Terracotta object, Period III.

Village/Site	Cultural Assemblage
Balkot	Kushan and Medieval
Batangi	Medieval
Buniyar	Kushan and Early Medieval
Datha Mandir	-do-
Isham	Kushan, Early and Late Medieval
Lari	Kushan and Late Medieval
Mahura	Kushan and Late Medieval
Naupura	Late Medieval
Saidpur	Late Medieval
Salamabad	Kushan, Early and Late Medieval
Silikot	Kushan and Medieval
Uri	Kushan and Medieval
Urusa	Kushan and Medieval
Uranbuha	Medieval *Ziarat*

30. Exploration in District Jammu.— In the course of village to village survey along the river system of the Devak, the Aik and other local hilly torrents, in Tehsil Jammu and Nawan Shahr of District Jammu, K.C. Nautiyal of the North-western Circle of the Survey discovered the following sites:—

Village/Site	Cultural Assemblage
Beaspur	Nineteenth century temple
Dablehr	Kushan, Late Medieval pottery including glazed ware, terracotta objects
	Late Medieval fort known as Jasmirgath and Late nineteenth century temple
Muggoali	Kushan, Late Medieval pottery including glazed ware and terracotta object
Mule Chak	Late Medieval temple
Prama Chak	Late Medieval pottery and terracotta objects
Sakaun	Late Medieval temples

KARNATAKA

31. Hampi, Hospet Taluk, District Bellary.- In continuation of last year's work (1982-83 pp 32-33), the excavations were resumed under the direction of M.S. Nagaraja Rao, assisted by C.S. Patil, and BalaSubramanyam at Hampi in the area called Nobleman's Palace. The

excavation of Nobleman's Palace 2 started last year, and was completed. Excavation of two more palaces named 3 and 4 situated to the west of the Nobleman's Palace 1 has been taken up during this year and the work is in progress. There was another simple structure numbered as Nobleman's Palace 4A. One of the important discoveries of this year was a toilet block.

Nobleman's Palace 3: (pl. 28), This was a small palace consisting of a main structure (15.30 x 11.55 m) located in an enclosure (21.50 m x 29.00 m). The main structure consisted of two halls one behind the other. The front hall which was at a lower level than the rear, was approached by a flight of steps in the centre. The rear hall was approached by two flights of steps at the corners. There were four central pillars in the open facade of the hall indicated by rectangular depressions at regular intervals. In the centre of the hall was a spacious rectangular room with doorway in the front. The frontal sides of the front hall consisted of a well cut moulded stone plinth whereas the second hall comprised of a neatly moulded plinth of stone, brick and mortar. The floors of halls and rooms including the open area in the front of the main structure were well plastered. The enclosure wall was of thick blocks of stones with mud mortar and the walls of the main structure were of rubble masonry.

Nobleman's Palace 4: (pl. 29). This sturcture (40.00 x 23.70 m) also a palace though similar in plan to that of the Palace 3 had some distinct features. The lower front hall had a large spacious open court in the front with three flights of steps one at the centre and two at the extremities at the entrance and four central pillars in the open facade. Only the pillar bases were found. On the sides of the hall were corridors with open facade raised to the level of the rear which was at a higher level than the front. The rear oblong hall adjacent to the middle rear part of the front hall was approached by the two flights of steps from the front hall at its corners. It had two rooms on the exterior near the front corners. The square basement located in the rear part of the hall had a single flight of steps in the centre of the front. There was wide space around the basement. Both the halls consisted of well-cut moulded plinth on the frontal side only whereas the basement of the room in the second hall was horizontally moulded on all the sides.

The floors of the halls, the corridors and the rooms were even and well plastered.

Nobleman's Palace 4A: This structure located to the north of Palace 4 was different from the features of the Palaces described above. It was a rectangular structure facing east with walls on all the sides. There were six vertical parallel cavities at regular intervals in the western wall that originally contained timber pillars. The floor was of rammed earth and plastered with mud.

Toilet: This block located west of Palace 4A was a latrine and was entered through a narrow door in the front. The spot of excretion was located on the raised platform with flight of steps. The spot had two foot-rests on the sides of a sloping passage leading to a pit behind. The third step of the flight of steps was sufficiently wider. At the back in the centre of the third step was a hole. The purpose of making the third step much wider and providing a hole at the back was obviously for the urine to flow through the hole at the time of excretion. In the case of men urine oozed out at a longer stretch. That was why the third step was wide enough not to allow urine to flow down over the steps. The front corners of the foot-rests against walls

were semi-circular pedestals meant for keeping water pots.

32. Excavation at Hampi, District Bellary.— In continuation of 1982-83 season's work, the Mid-southern Circle of the Survey under the direction of B.S. Nayal assisted by K.P. Poonacha, Venkata Siva Sarma, M. Loganathan, Balakrishna Unnittan and J. Ranganath resumed excavation in the area south of King's Audience Hall. The objective to carry out further excavation was to trace a complete plan of the so called Citadel area.

Accordingly, the area 25 m south of the huge residential complex exposed during the previous season was taken up for excavation. It revealed the remains of five massive platforms (STR-1 to STR-5) veneered with ashlar masonry and extant only up to the plinth level. These platforms had rows of pillar bases of varying dimensions and belong to a single period. Other structures exposed included a huge brick faced tank (STR-6) which was of a later addition.

All these five structures (pl. 30) were rectangular on plan with north-east and south-west orientation. The plinths of the structures were mostly disturbed. In order to ascertain the nature of filling and cause of disturbance in the foundation, trial pits were dug at various points. The trial dig revealed that the natural granite surface was undulated and to make it even, the surface was filled with loose earth and rubble. This loose packing with percolation of water inside was mainly responsible for the sinking of the foundation and collapse of the structure.

The intact portions of the plinth available towards the northern limits revealed a uniform architectural pattern of construction. The extant height of the plinth measured 1.04 m and 0.80 m at its maximum and minimum respectively. It was veneered with four courses of granite two of which were plain (1st and 3rd) and the remaining two were decorated (2nd and 4th). These courses were constructed one above the other alternatively. The decorated courses showed a semicircular motif carved in low relief, projecting at a regular interval of 70 cms.

The structures (STR-1 to STR-5) exposed during the excavation brought out a unique lay out plan for the first time in the Citadel complex. This consisted of two separate structures forming one unit with a narrow passage of 0.65 m width in between. Each unit was supported by a broad avenue of 4.60 m width, on the eastern and western sides. Two such independent units and a portion of the third unit were exposed.

The first unit (STR-1 and STR 2) measured 75.50 m (north-south) x 9m (east-west) and 74.0 m (north-south) x 13.60 m (east-west) respectively. Four rows of pillar bases forming three bays were provided inside STR-1. The distance between each row was 2.5 m (north-south) and 1.80 m (east-west). STR-2 accommodated six rows of pillar bases arranged to form five bays and the distance between each row was 1.90 m (north-south) and 1.75 m (east-west). STR-3 andSTR-4 formed the second unit each measuring 61.5 m (north-south) and 9.0 m (eastwest). At the northern end of STR-3 a brick faced tank was constructed at a later date. Evidence of STR-4 being extended by 9.0 m was also noticed. Both the structures accommodated four rows of pillar bases each arranged with an average width of 1.85 m (north-south) and 1.70 m (east-west) forming three bays.

STR-5 situated at about 4.60 m east of STR-4 formed part of the third unit measuring 70.0 m (north-south) and 9.0 m (east-west). It consisted of 4 rows of pillar bases, forming three bays and the distance between each row measured 1.90 m (north-south) and 1.85 m (east-west) in width.

Located within the Citadel complex, these massive platforms with broad avenues leading towards King's Audience Hall and the Throne platform might have accommodated security guards meant for the Citadel complex. Excavation carried out in between the inner enclosure wall and the southern side of these structures brought to light huge granite blocks in east-west direction and the displaced pillar bases. They probably formed a part of another huge platform. The plan and purpose of this platform was yet to be ascertained. About 20 m south of STR-2, a highly disturbed soak pit consisting of three terracotta rings was also exposed.

The tank (STR-6) situated at the northern end of STR-3, was square on plan measuring 7.25 m x 7.25 m. The brick courses of the tank covered part of the plinth of STR-4 on the western side, representing the latest structural activity in the complex. It was dug in the granitic bedrock in four stages in stepped diminishing order, each one measuring 55 cms in width and 53 cms in height, except the bottom-most which measured 1.60 m in height. The first three stages were lined with brick in lime mortar mixed with stone chips. The bottom and the lowest step of the tank were plastered with a thick layer of lime mortar. The brick lining at many places was badly disturbed. However, a few intact bricks available measured on an average 22 x 18 x 6 cms. The rectangular granite blocks lying parallel to the northern face of the STR-5 and STR-4 exposed during the excavation revealed that they probably used to accommodate lime mortar channels through which water was drawn to fill the tank (STR-6).

Various types of antiquities were unearthed during the course of excavation. Mutilated head and bust portion of human figures and animals in stucco were found. Most of these stucco figures retrieved from the avenues were in profile and indicated that they formed part of the panels adorning probably the facade of the platforms facing the main avenues. They mostly depicted socio-religious aspects. Religious mark noticed on the forehead of male figures was noteworthy (pi. 31).

Stone objects unearthed included fragments of architectural members and mutilated sculptures stylistically dateabel to the later Chalukyan period (pi. 32). Stone plaques depicting entwined Nagas and other floral motifs of the Vijayanagara period were also found,besides a large number of granite querns. A number of Sivalingas in soapstone, which were collected, throw light on the religion of the period.

Many copper objects including coins and rings were also unearthed. Fragments of glass bangles, iron rings, broken ivory objects, etc. were some of the antiquities encountered during the excavation. Terracotta objects such as beads (pi. 33), human torso, elephant heads, etc were also found.

The ceramic evidence was represented by typical medieval wares comprising both plain and decorated varieties of red, grey and black wares. The types included bowls, *handis,* perforated bowls, *lotas,* etc. Miniature lamps were also collected. Chinese porcelain of different shades with floral and natural scenes and some of them bearing Chinese letters (pL 34) were

also encountered besides the imported variety of celadon ware.

33. Exploration in the Raichbal Valley, District Gulbarga:— K. Paddayya of the Deccan College Post-graduate and Research Institute, Pune as part of research project sponsored by the University Grants Commission, carried out systematic explorations in the Raichbal valley lying in the Shorapur Taluk of Gulbarga District. The area consists of a basin-shaped depression of erosional origin and measures about 300 sq. km. in extent. It is surrounded by limestone-shale plateaus on the western, northern and southern sides and by granite hills on the eastern side. With a view to understanding the changing settlement patterns stretching from the Acheulian culture to the historical period, intensive survey was undertaken in the southwestern part of the valley. It led to the discovery of a number of sites belonging to different cultural phases.

Sites belonging to the Acheulian culture were found at the following localities: Hebbal Khurd (Locality II); Teggihalli (Localities II and III); Sadab (Localities I and II); Mudnur (Localities I and II); Fatehpur (Localitiy I); and Yadihalli (Locality I). All these were occupational sites, lying either along ephemeral streams or in the foothill area of shale-limestone tablelands. These took the form of discrete clusters of artifacts measuring 40 to 50 m along the longer axis. The largest of these localities (Locality X at Mudnur) measured about 250 x 140 metres with over four-hundred artifacts and other remains associated with human occupation scattered on the surface. The sections exposed in rain-gullies and field — and canal cuttings clearly showed that the Acheulian horizon (15 to 20 cm in thickness) directly overlaid bedrock, which at some places was intact but at other places weatherd *in-situ* to give rise to whitish/brownish kankary murum-like deposit. At some places the Acheulian occupational horizon was capped by black cotton soil measuring up to one metre in thickness. In most of the localities the horizon was associated with blocks (measuring up to 25 to 30 cm. across) of limestone, dolerite, schist, granite, etc., which were obviously brought to the spot by man for use as raw materials for tool-making. Limestone is the principal medium worked upon by the Acheulian groups of this area. Cleaver was the dominant type in the assemblages; 'V, 'U' and ultraconvergent were the three major shapes represented. Handaxes, knives, picks, points, polyhedrons, chopping tools and hammer-stones comprised the other types of assemblages. The regularity of shapes, the thin cross-sections and the refined nature of flaking showed that these assemblages belong to an evolved Acheulian tradition. However, one of the localities at Mudnur (Locality VIII) had yielded an assemblage almost exclusively consiting of large pointed handaxes with rough outlines, thick cross-sections and deep negative flake-scars. The site most probably represented an early phase of Acheulian culture, thereby indicating that the culture flourished for a long time in the valley. Another important feature brought out by the present field work was the occurrence of fossil fauna at Locality II near Teggihalli, Localities II and III near Mudnur and Locality I near Sadab. The osteological and dental remains were highly mineralised and belong to the *Bossp., Elephas sp.* and *Equus sp.*

Middle Palaeolithic sites were discovered at Agni (locality I) and Agtirth (Localities 3, 4 and 5). Of these, Locality 3 at Agtirth was a primary site where the artifacts occurred on

granitic surface; this horizon was overlain by 70 cm. thick brownish kankary silt mixed with black soil. The artifacts were of brownish chert and consisted of scrapers, borers, points and other types.

Mesolithic sites were found at Hebbal Buzurg (Locality 5), Hebbal Khuri (Locality 1), Agtirth (Localities 2, 3 and 4), Rampur (Locality 1), Teggihalli (Locality 1), Mudnur (Locality 2 and 3), Fatehpur (Locality I) and Arikera (Localities 2, 3 and 4). From the extensive discoveries in such sites (some measuring upto 300 to 400 m. along the longer axis), it appeared that these witnessed repeated human occupations covering fairly long period. Whitish chert procured in the form of small nodules from limestone formations served as the main raw material for working. The artifact types included simple, retouched and backed blades, points, scrapers, borers and fluted cores. One of the sites had also yielded an ostrich eggshell piece. At Agtirth, Arikera and Sahadgi a number of Late Medieval sites were noticed. At the latter site the habitation debris covered an area of 300 x 250 meters and had a thickness of over half-a-metre. These sites yielded a large number of sherds of coarse red, burnished red and black wares; rubber-stones, stone artifacts and animal bones.

34. Exploration in Districts Gulbarga and Raichur.— S.G. Ghatapanadi of the Depart ment of History, Gulbarga University carried out exploration of a Buddhist site located on the top of the hillock, about 2 km. away from the village, Gurusanagi, on the right bank of the River Bheema.

The survey brought to light the structural remains of a Buddhist stupa, along with a small stone panel showing *Maha-Bodhi* tree, a mutilated image of a Buddhist deity, a stone pedestal, roof-tile and architectural fragments of die entrance of a stupa resembling those of Sanchi Stupa. These were all lime stone carvings— a characteristic of Buddhist art of South India. Besides, two circular basements of stupas built of bricks of large size, ascribable to the Satavahana period were discernible. The basements of the stupas were on the elevated area having no sign of mound formation. The broken pieces of the structural remains of stupa were used for the erection of loose compound walls of Sivalingesvara and Chand Saheb's temples. This Buddhist stupa could be assignable to the first-second century A.D.

The discovery of a polished limestone implement, possibly an axe of the neolithic period, was noteworthy. Besides, three well-preserved inscriptions carved on a boulder in Kannada script and language, of eleventh-thirteenth centuries also deserve mention.

Among other important places mention may be made of Bagali, Itgi and Kuknoor. At Bagali, the foundation of a brick-built temple of the Satavahana period was noticed, lying on the north of the Mallikarjuna temple. At Kuknoor in District Raichur, a victory pillar of the time of the Early Chalukyas of Badami was traced on the *dvara-mandapa* of the Mahamayi temple. There was an inscription stating that the present *dvara-mandapa* was built afresh when the old one was destroyed by fire during the Turkish invasion.

35. Exploration in District Kolar.— In the course of exploration G.S. Narasimhan of the Mid-southern Circle of the Survey discovered the following sites:—

Village/Site	Cultural Assemblage
Aitarrsanahalli	Historical site yielding red ware.
Annehalli	Hero stone
Balageri	Megalithic burials, sculptures
Belahalli	Late Medieval temple
Biramanahalli	Hero-stones, *c.* eleventh century A.D.
Chillapalli	Medieval sculpture and hero stones
Cholaghatta	Megaliths
Gangapura	Megalithic stone circles
Gattahalli	Medieval sculptures and hero stones
Haleri	Megalithic stone circles
Harati	Medieval sculptures
Ijugurki	Megaliths
Iragasandra	Medieval Sculptures hero stones and a temple of *c.* eighteenth century A.D.
Jannaghatta	Temple, *c.* fifteenth century A.D. (Vijayanagar period)
Jodi Bellambari	Inscription, c. fourteenth century A.D. and temple of Vijayanagara period
Kadaripur	Narsimha temple, *c.* sixteenth century A.D. (Vijayanagara period)
Kalhurn	**Sculptures, hero stones, c. tenth-eleventh** century A.D.
Karadabande Hosahalli	**Megalithic stone circles**
Kariyanaballi	**Temple,** *c.* **tenth** century **A.D.** (Vijayanagara Period).
Kondarajanahalli	Megalithic
Kortimallandahalii	Megalithic
Kuduvanahalli	Sculptures, hero stones *c.* eleventh-twelfth century A.D.
Kyalanur	Siva temple, *c.* tenth century A.D., Chandra sekhara temple, *c.* sixteenth century A.D., and inscription sculptures, hero stones, *c.* fifteenth century A.D.
Manigatta	Sculptures, hero stones, *c.* tenth-eleventh
Milsandra	Inscription, c. ninth century A.D.
Mullahalli	Sculptures, hero stones c. eleventh century A.D.
Nachhalli	Sculptures, hero stones, c. tenth-eleventh century A.D.
Nagnaikanahalli	Sculptures, hero stones *c.* sixteenth century A.D.
Nayakanahalli	Sculptures, hero stone *c.* Eleventh century A.D.
Parsiganahalli	Sculpture, hero stone, *c.* sixteenth century and medieval temple
Shettimadamangala	Scuplture, hero stone with inscription, c. eleventh century A.D.

Village/Site	Cultural Assemblage
Shettivarhalli	Megalithic stone circles.
Sulurn	Megalithic stone circles, cairns, mehhirs and rock shelters.
Tippanhalli	Sculptures, hero stone, *c.* tenth century A.D.
Tirumalakoppa	Megaliths
Tondala	Sculpture, hero stone c. eleventh century A.D.
Toradevandahalli	Inscription, A.D. 1547 sculptures, hero stone, *c.* sixteenth century A.D.
Totli	Historical site yielding predominantly raw ware
Vadagere	Inscription and sculptures, *c.* seventeenth century A.D.
Venkatapura	Neolithic burnished grey, buff and red wares stone axes; and megaliths
Yadahalli	Siva temple and inscription, c. tenth century A.D.
Yanadihalli	Inscription, *c.* eighteenth century A.D.

35. **Excavation at Banahalli, District Kolar.** — The Mid-Southern Circle of the Survey conducted excavations under the direction of L.K. Srinivasan and B.S. Nayal assisted by C. Krishnamurthy, C.L.N. Sastry, G.S. Narasimhan, C.B. Patil, M.V. Visveswara, M.V. Malli-karjuna and G. Krishnamurthy, with the following objectives: (i) to determine the possible relationship between the neolithic cultures of Pennar (Kurnool region) and Palar (north Arcot) basins; (ii) to know the earliest habitation of the neolithic culture in the peninsular region with reference to grey ware tradition; (iii) to obtain more light on the painted pottery tradition and (iv) to study the cultural sequence of this region.

Banahalli (Lat. 12° 58' N long. 78° 66' E) locally called as 'Bettada Banahalli', probably due to its vicinity to the hill, lies in the upper reaches of the Palar basin. A motorable tar-cum-mud road of about 3 km from Takal Railway station leads to the village. Near the entrance to this village, on the right side of the mud road, is a hill of castellated granite block at the base of which stands a vast mound which is known as 'Sirimannina dibba' meaning 'mound of the rich soil'. The mound originally covered an area of approximately 500 metres rising to a height of about 6.5 metres. The mound has been cut across in east-west direction on the southern periphery in order to provide an approach road to the village.

The importance of the site was noticed as early as 1967 (Indian Archaeology, 1967-68 and 1972-73 — A review pp. 37-39 and p. 27 respectively) and on the basis of which a trial dig was conducted by the Southern Circle of the Survey in 1972 (1972-73 p. 29). This digging revealed a two-fold cultural sequence, viz. Neolithic and Megalithic which was not satisfying to the aim it was intended for. With a view to establishing clearly the cultural sequence of the site a large scale excavation was undertaken. Initially two trenches viz. A and A 1 each measuring 10 m x 10 m were laid. Natural soil was reached only in the northern half of quadrant 2 of Trench A 1 Fig. 1 at the depth of 6.28 m with 23 distinct layers, the 24th being natural soil.

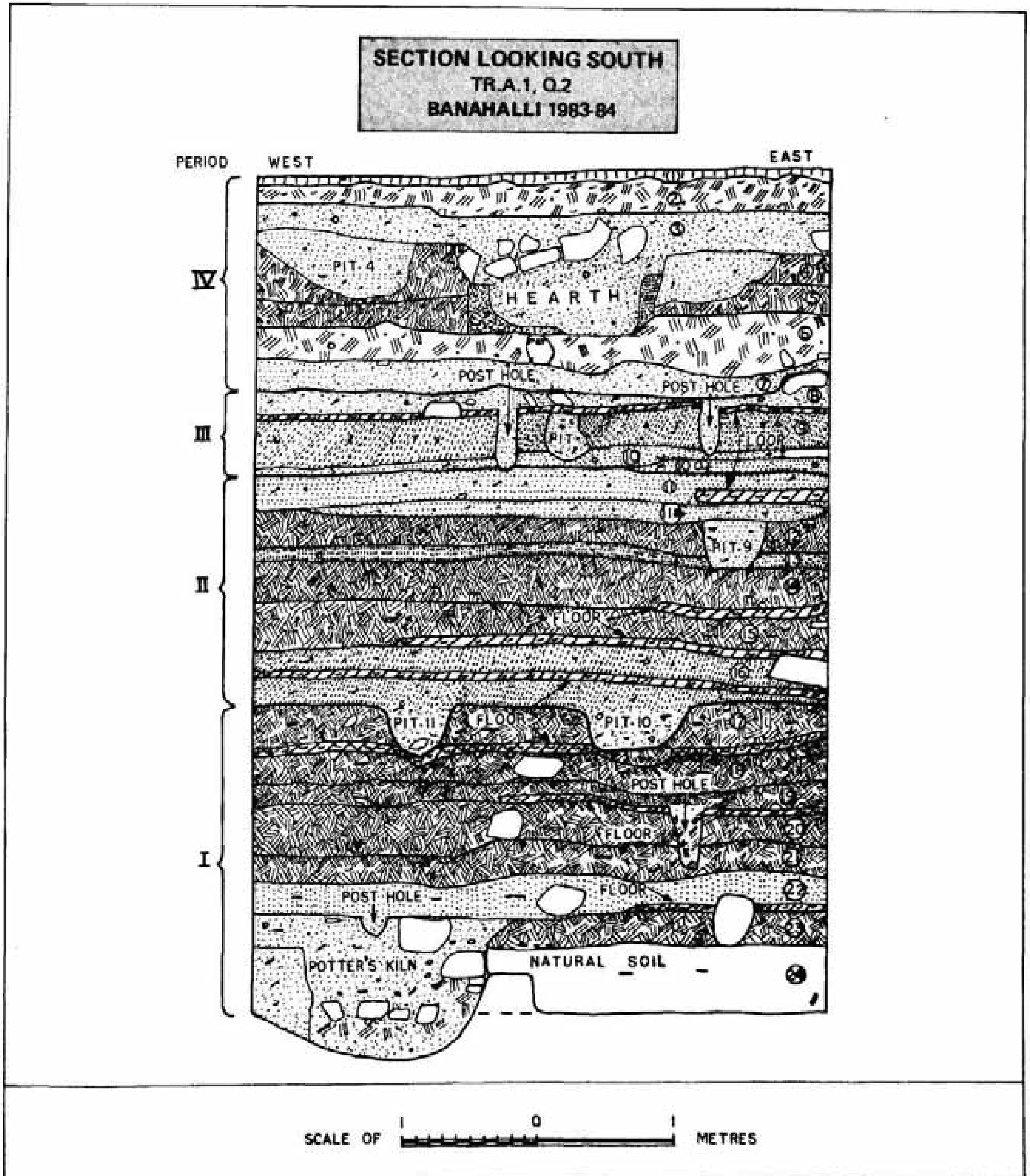


Fig. 6. Banahalli : Section looking South Trench A-1, Q.2.

Two more cultural deposits were recognised in addition to two periods encountered in a previous excavation. The cultural sequence of the site was as follows:—

Period I	Neolithic (layers 23 to 17)
Period II	Neolithic - Megalithic (layers 16 to 11)
Period III	Megalithic (layers 10 to 8)
Period IV	Early historic (layers 7 to 1)

Period I was represented by 2.29 metres thick habitational deposit comprising 6 layers and mainly characterized by the occurrence of well burnished buff, red and grey wares. The last one having the post firing ochre colour painting on the rim portion, which made its appearance from the earliest levels. The pottery of this period was mainly handmade. The most outstanding types occurring in all the fabrics was the lipped bowl with round base, globular pots with a flared rim and storage jars, in thick fabric with incised decorations on the exterior. One of the globular pots in highly burnished grey ware with flaring rim and ochre painting was found in a pit sealed by layer 22. The pot contained soil with small and big bones of a quadruped representing an animal. Another important feature noticed in this period was the occurrence of black-on-red ware in the earliest level which not only was the first of its kind in this region, but significantly pointed to the contact of neolithic folk with the people using painted pottery, i.e. black-on-red. The black-on-red ware was too fragmentary to determine the shape of the vessel. The pottery was of medium fabric, light red in colour and comparatively well burnt. The lines were thick. Exploration in the nearby rock shelters overlooking the mound have also yielded balck-on-red ware. One of them bore a design of cross hatched segment and triangles.

As far as the lithic appendage was concerned, no miehrolithic tool other than two cores of quartz, was reported. Among other antiquities recovered from the excavation mention may be made of charred and polished bones, one of which bore cut marks. The occurrence of large quantities pf charred bones with cut marks revealed the food habits of the neolithic folk. The later phase of this period, especially the layer 17, was marked by the presence of thick-buff-red ware pottery in huge quantities comparable to the earliest red ware pottery of Nagarjuna-konda and also of Dailkalmalai, Salem District. But it was mainly used in the preparation of floors.

Period II with a total habitational deposit of 1.07 metres and consisting of 6 layers from 16 to 11 showed the overlap between the Neolithic and the Megalithic cultures. While the lower levels accounted for higher percentage of Neolithic ware, the upper levels yielded more megalithic pottery. The neolithic ware was represented by grey, buff and red ware of both burnished and unburnished variety, with lip painting on grey ware only. The shapes included lipped bowls, jars and globular pots with flaring rim. The megalithic ware mainly consisted of black-and-red ware, balck ware and red ware. The main types comprised of bowls with vertical or straight sides, round base and dishes, etc. Among notable antiquities, were circular and tubular beads or shell, quartz with bands, iron nails, charred and polished bone stylus with cut

marks and copper spoons, etc.

Period III, distinguished by pure megalithic culture, was represented by 0.65 metre thick deposit comprising 3 layers from 10 to 8. The ceramic industry was represented by black-and-red ware, black ware and red ware. Main types consisted of straight sides with or round base, dishes, storage jars, funnel shaped lids with varieties of knobs especially in black-ware. A few potsherds with marks were also found. The antiquities included micro beads of glass, stone beads with bands, wheels, balls and arecanut beads of terracotta, shell bangles, knife handle made of horn, and iron objects like nails, spear heads, arrow heads and knife along with two fragmentary bangles and bead of copper.

Period IV, i.e. Early Historic revealed a total deposit of 1.50 metres, representing seven layers containing black-and-red ware, red slipped ware and well known russet-coated painted ware commonly known as Andhra ware. The paintings occurred normally on red ware or black and red ware. The designs comprised of small and wavy lines in vertical rows, groups of short vertical strokes, thin parallel bands and dotted lines, etc. The paintings were invariably found on the outer side and done under a russet slip. The main pottery types included globular pots, small pots, shallow dishes, disc-shaped bowls, perforated lids and storage jars, etc.

The antiquities, from period IV comprised of beads, such as micro, barrel, circular, tubular, disc, amalaka, ghata, ring and truncated types made of terracotta, shell and semi-precious stones, viz. coral, agate, quartz, crystal; terracotta wheels, toy-pots, varieties of hopscotches, ear ornaments and burnishers, ivory dice, sandstone pounder; iron dagger, sickles, axe, knife blade, chisel and spearhead. A terracotta chin having four oval shaped links and a plumb-bob with a hook deserved special mention.

The structures exposed in the excavation provided a glimpse of settlement pattern right from neolithic to the early-historic period. In period I, the floors were made of well rammed potsherds with ashy soil. The bottom generally contained larger sherds while in the upper, smaller and thick sherds were used. In one of the floor levels (layer 17 in quadrant 3 of trench A) portion of circular house plan with an approximate diameter of 3.20 metres was exposed. An interesting point to be noted here is that the well laid out potsherds formed an exterior 'apron' while the interior was prepared of red murrain mixed with clay and cowdung. A ridge of 5 to 8 cms high and 10 cms wide at the base was provided in between the interior and exterior of the house to check the inflow of rain water. In quadrant 2 of trenche A 1 in the earliest levels, small rubble stones were found laid on the bottom of layer 22. Since the area excavated at this level was too small, its nature, extent and functional aspect could not be ascertained. Another important discovery was that of the potter's kiln. This was circular on plan having a radius of about 1 metre, cut into the natural soil to a depth of more than 0.75 m. The interior surface was plastered with gritty clay to an average thickness of 10 cm. The top portion of the kiln was covered with thick lumps of burnt red earth along with some stones on the western side. On the eastern side a hole was noticed all along the depth covered with a big stone slab and a few smaller supporting ones, packed with red murrain and black clay.

In period II also, the floors were of red or yellow murrain (as observed in quadrant 1 of trench A) and ashy clay. Here interestingly in addition to pottery, small stone chips were

also used in the preparation of floors.

In period III, the floors were made of red murrain with or without clay but occasionally with potsherds.

The upper layers of period IV were characterized by circular house plans with post-holes and well laid floors of red or yellow murram, rammed with clay. In the latter phase, (layer 5 and 4) a hearth with a diameter of lm. and depth of 1.02 m and double oven was braced. The contents of the hearth include iron slags and ash. Two huge jars in red wares with conical base, were found in pits. However, the most significant structural remains encountered in the early phase was that of a huge rubble structure roughly circular on plan, having a diameter of 8.70 m with a massive retaining wall exposed to a length of 10 metres on the south-ern periphery running in south-south-east and north-north-east direction. The retaining wall showed three courses of rubble, laid in 3 to 4 rows with a few huge natural boulders scattered in between. This was perhaps constructed in order to check the erosion of the mound.

36. Exploration in District Uttarakannada.— S.S: Nayak of the Mid-southern Circle of the Survey discovered 56 sites in the district in the course of the village to village survey. The sites are listed below.—

Tehsil	**Village/Site**	**Cultural Assemblage**
Kumta	Bastikera	Medieval sculptures
Sirsi	Ajjarni	Later Chalukyan temple
do--	Ajjibal	Temple dateable to seventh century A.D.
do--	Andgi	Later Chalukyan temple
do—	Badangod	Mud fort of late Medieval Period
do—	Banavasi	Early Historical
do—	Barur	Medieval
do—	Begedde	Temple of Vijayanagara Period
do—	Belenkeri	Later Chalukyan temple
do—	Bengali	Inscribed Pillar eighth-ninth century A.D.
do—	Bhikanelli	Temple dateable to seventeenth century A.D.
do—	Bidralli .	Later Chalukyan temple
do—	Dadavalli	Temple dateable to seventeenth century A.D.
do—	Gadgeri	Temple dateable to seventeenth century A.D.
do—	Gonuru	Temple of Vijayanagara Period
do—	Gudanapur	Early Historical
do—	Hedligi	Temple dateable to seventeenth century A.D.
do--do	Hadligi	Late Medieval sculptures
-	Hebbaffi	Later Chalkuyan temple
do-	Hebbatti	Mud fort of late Medieval Period
do-	Hosakoppa	Temple dateable to seventeenth century A.D.

Tehsil	Village/Site	Cultural Assemblage
Sirsi	Iduru Kabbe	Later Chalukyan Period Temple of
-do--do	Kadgod	Vijayanagara Period Brahami
--do--d	Kadkod	Inscription second century A.D. Temple
o--do--	Kadligi KaUi	dateable to seventeenth century A.D.
do--do-	Kalkardi	Temple dateable to seventeenth century
-do--do-	Kalkuni	A.D. Inscription nineteenth century
-do--do	Kantraji Karur	A.D. Inscription nineteenth century
--do--d	Karuru	A.D. Inscription nineteenth century
o--do--	Kiruvathi	A.D. Later Chalukyan temple Temple
do--do-	Kogod	dateable to seventeenth century A.D.
-do-	Kuppagadde	Vijayanagara Period Inscription
-do--do	Kuribail	nineth-tenth century A.D. Temple
--do-	Malnji	dateable to seventeenth century A.D.
-do--do	Margundi	Later Chalukyan temple Fort of
-	Marigadda	Vijayanagara Period Later Chalukyan
-do--do	Masi gadda	temple Later Chalukyan temple Temple
--do--d	Muttal koffe	dateable to seventeenth century A.D.
o--do--	Narbail	Temples Megalithic stone circles
do--do-	Navangeri	Temple dateable to seventeenth century
-do-Sor	Purudekeri	A.D. Temple of Vijayanagara Period
ab	Sanfrolli	Temple dateable to seventeenth century
	Tarakanehalli	A.D. Inscription of ninth tenth century
	Tigni Unchalli	A.D. Later Chalukyan temple Temple,
	Vaddinuop	seventeenth century A.D. Temple of
	Vadhale	Vijayanagara Period Temple,
	Venkatapur	seventeenth century A.D. Inscription
	Yasli Nirlgi	ninth-tenth century A.D. Sculptures of
		Chalukyana Period Inscription
		ninth-tenth century A.D. Late
		Chalukyan temple

KERALA

37. Excavation in Mesolithic Rockshelter at Tenmalai, District Quilon. — P. Rajandran, U.G.C. Research Associate, excavated a rock shelter site at Tenmalai, for determining the stratigraphical potentiality of the site. Several trenches were taken up within the shelter which revealed a total cultural deposit of 35 cm. It contained good amount of charcoal and mesolithic artifacts which started declining below 30 cm till the bed rock was not touched. The lithic industry was represented of flakes made of quartz.

LAKSHADWEEP

38. A Brief Report on Lakshadweep Exploration.— M.C. Joshi of the survey with the assistance of A.K. Sharma, A.K. Sinha, S.S. Saar and B.R. Rajput undertook preliminary explorations in Lakshadweep group of islands with a view to locating the ancient remains and assessing the already known monuments and cultural relics. The following islands, out of twenty-seven, could be explored : Amini, Andreth, Cheriyam, Kadmat, Kalpeni, Kavaratti and Minicoy.

As a result of these explorations archaeological sites, structural remains, tanks or *kulam* including rock-cut types, were located at Androth, Amini, Kavaratti Kalpeni, Cheriyam and Minicoy. Significant amongst the explored sites was one at Androth showing at least two phases of occupation in an exposed section with a gap indicated by a sand deposit and an ancient structure at the top, besides a small tank in the uninhabited island of Cheriyam which suggested its occupation in the past. Mosques known as Mohiu'd-Din-Palli at Kalpeni and Prot-Palli at Kavaratti were found to have been raised on pre-Islamic structural remains. Another important discovery was that of a head of sculpture made of pounded coral stone (stucco) and plaster like those of Buddha images found at Androth earlier and remains of a wall of coral blocks, which seems to be an embankment, possibly raised to check the sea waves at Minicoy island. Pottery, mainly found at Amini, Androth and Kalpeni, which was probably imported from outside, consisted of small red ware sherds.

The mosque architecture of the island bore an imprint of older temple plans in more than one respect viz. (i) existence of single *mihrab* in the back wall of the inner most chamber with a circumambulatory passage, (ii) one or more frontal compartments or verandah on the east (iii) and presence of basal mouldings on the exterior in some cases. Majority of the mosques *(pallis)* have attached tanks or *kulams* but they have no fixed location as some of them were on the east, and while others were on the sides. In certain instances there were more than one tank around a *palli* of mosque. Unlike most of the mosques in upper India, the additions and extensions to mosques in Lakshadweep Island were made generally only on the east and not on the sides. Some of the mosques preserved excellent specimens of woodwork and traces of fine calligraphy of later dates. The tanks which were generally square and rectangular in some cases showed several interesting designs. Outside most of the old mosques were found groups of graves of which a few were dated in the first-half of the seventeenth century A.D.

MADHYA PRADESH

39. Exploration in Districts Dewas and Shajapur.— In continuation of the last season's work M. Uma Maheshwara Rao of Central Circle of the Survey explored the banks of River Kallisindh covereing both Dewas and Shajapur districts.

District	Tehsil	Site	Cultural Assemblage
Dewas	Sonkach	Bhoteswar	Medieval mound on the right "bank; thin grey sherds having thin black polish over it.
-do-	Sonkach	Ghatiakalan	Late Historical
Shajapur	Shajapur	Nipania	Kayatha ware, Malwa ware and a few microliths
-do-	Shajapur	Sundarsi	Kayatha ware-Black and Red ware, Malwa and Paramara temple and a number of loose sculptures.

40. Explorations in Pachmarhi, District Hoshangabad.— In continuation of the previous work on rock paintings of Central India, S.S. Gupta assisted by A.S. Stevenson, A.J. Nambiraju, K.M. Girhe, P. Biswas and N.K. Nimje studied rock shelter paintings of Pachmarhi under the guidance of K.D. Banerjee of the Prehistory Branch of the Survey.

Paintings have been studied at various localities in and around Pachmarhi namely Maro-deo (22°29' N, 78°29' E) to the east of the old Pachmarhi-Piparia road, Baiaberi on the opposite flank of Marodeo, Jambudip (22°28' N, 78°26' E) about two km north of Pachmarhi on the northern side of the Jambudip nullah, Bazar Cave and Nimbubhoj, both near Pachmarhi bus stand on the way to Jatashankar Emalikhoh (22°27' N, 78°26' E) near Apsara Vihar water falls, Dorthy deep and Monte Rose (22°27' N, 78°23' E) to the North-eastof Dhupgarh. Of all these, clear superimpositions were noticed at 'arpdep, Jambudip and Emalikhoh. At other places these were either not so clear or absent. On the basis of superimposition, style and content, the paintings were divided into four groups:—

Group - I: These were in yellowish white, slighly faded, the size of the figures being very large and were found superimposed by the red washes coming over them from the original rock surface. The painting included the drawings of individual animals wild or domesticated and fighting scenes. The painting of a deer with branched horns measured almost one, from the head to the tail (pl. 35). Figures of this group were completely filled with colour. Human figures were shown riding buffaloes, or standing on the ground with spears or bows and arrows or swords and shields in their hands. Their bodies were shown broad at the shoulders and narrow at the waist, like athletes. Arrows have long and pointed heads unmistakably metal ones. Their clothing appeared to be of cotton fabric, only the waist and the upper hip region

was covered (pl. 36).

Group - II: Figures of this group were smaller in size and in light red. They lay over the figures of yellowish white whenever superimposition of the two was seen. Scenes included the drawings of individual animals, domestic scenes, hunting and fighting men. Human figures were shown riding on buffaloes. In one particular case of a buffalo rider, the animal was in red while the man sitting on it was in white. Both were slightly different in style. It was possible that the human figure was added later. Other figures included animals such as elephant, deer, cattle, etc.

Group - III: These figures were in pure white and lay over figures of light red when ever superimposition was noticed. Figures were smaller in size and included battle scenes in which men were shown holding swords, both of straight and curved varieties. There was one peculiar cavalry sword with claw-like tip clearly of the late medieval type. Men were shown with small loin cloth or *dhoti* on and sometimes a long skirt or tunic on with two long pieces of cloth hanging from the waist. Other scenes included household scenes, honey collection, man attacking an elephant, etc. In one of the shelters at Marodeo two women were shown in a house, one cooking and the other holding a child. The roof of the house was shown with *zigzag* lines from which a few pots, a basket and a quiver full of arrows were hanging. The hair of the women was tied in a bun. These women wore long skirts (pl. 37). In another scene a mother was shown suckling the child on her lap (pl. 38). At Jambudip an elephant was in white and in natural form while the man attacking it with a spear was in red. It was possible that the man was added later (pl. 39).

Group - IV: These figures were also small in size and lie over the pure white figures of the third group wherever superimposition was seen. In this group there were three types of paintings, they were white ones with red outlines, bichrome figures in red and white figures in pure deep red. The deep red figures were very simple in style. At Monte Rosa a panel of dancing men was seen, the figures were shown in a line holding hands. The heads were shown in round dots and the rest of the bodies and the limbs were in simple lines. Animal figures were also in simple stylized form. Other figures included battle scenes, men on horseback and standing human figures holding curved swords and round shields, bows and arrows and battle axes. There were also men blowing trumpets. Men wore small loin cloth with their hair tied in a bun. Horses were heavily caparisoned. Some of the warriors wore short skirts, tight at the waist and loose at the knee portion just like the Mughal's dress (pl. 40). In one of the shelters at Marodeo three male figures were shown in red and white with arrows and elaborate headdresses. The headdress showed a long hat like covering with horizontal lines on it. This was like some of the headdresses of the tribals of north-east India. Their arrows were barbed. There was also representation of animals in this group such as horse, deer, monkey, wild boar and the crocodile. A peculiar animal was painted at Jambudip. It had a long spindle shaped body with a long and painted mouth and a short and curved tail. Long bristles of hair was shown at the tip of the mouth. It was difficult to identify this animal, which appeared to be an aquatic one as it had two short fins at the lower rear part of the body.

There were also human figures in group-III playing musical instruments such as *dholak,*

trumpet, etc. The trumpets were long straight ones and short ones curved upwards (pl. 41) At Nimbubhoj a man was shown playing a harp (pl. 42). It appeared to be a Graeco-Roman harp. There were also scenes showing men collecting honey. These scenes could be seen at Jambudip, Marodeo, and Emalikhoh.

Exploration in this area has not resulted in any prehistoric finds except a few microiiths near one of the shelters at Jambudip. The superimpositions and styles of the paintings varied from locality to locality and even from shelter to shelter in the same locality. The painted figures did not show any extinct prehistoric animals. Implements and objects of human figures were similar in each group of paintings. Apart from all these, the dress and weapons, put together, place these paintings to a very late i.e. period to the medieval times.

41. Explorations in District Jabalpur.— Chandrashekhar Gupta of the Department of Ancient Indian History, Culture and Archaeology, Nagpur University carried out exploration in Jabalpur district and located a few sites yielding antiquities of different periods—

Site	Nature of Remains
Bahuriband, Jain Temple	A unique stone sculpture of Bhaubali showing serpents encircling his legs.
Hanuman *mandir.* on Sleemanabad-Bahuriband Road about 6 km	The figure of Hanuman, engaged in combat with several lions.
Sleemanabad on road leading towards Katni near Bagharranala	Fragmentary monolithic pillar
Kunda, 2 km. east of the village Sleemanabad on Jabalpur Katni Road	A neolithic oval ringstone of black beasalt having blunt perforations on both the flat sides and fragmentary head of lion.
Trigadda, on the right-hand side of the road leading to Railway station	Fragmentary monolithic pillar
Sleemanabad Road.	

42. Excavation at Gilaulikhera, District Morena. — R.K.Sharma assisted by Rahman Ali, M.C. Shrivastava, S.K. Dwivedi, Sudhakar Misra, B.S. Vyas and H. R. Pandey of Prachya Nike-tan and Naresh Kumar Pathak and Prakash Chaudhary of the Department of Archaeology and Museums, Government of Madhya Pradesh conducted excavations at Gilaulikhera (Lat. 26° 37' N; Long 78° 51 E) situated on the left-bank of the River Kumwari, a tributary of the Chambal. The small scale excavation was aimed at determining the potential and the cultural sequence of the site.

A trench measuring 30 x 5 m (GLK-I) was laid which was sub-divided into six sub-trenches of 5 x 5 m each (GOLK-IA B.C.D.E.F.) only. The digging was concentrated in GLK-IA and GLK I.F. The following cultural sequence has been encountered at the site:

Period IA *Proto-historic* was represented by grey ware associated with black and red ware and black ware. The percentage of grey ware as compared to black-and-red ware was less. Other pottery included was coarse, and fine thin red ware and basket-marked stamped pottery in red ware. The shapes were bowls and dishes. The soil was found extraordinarily hard-blackish-yellow in colour.

I(B) was dominated by grey ware and also included black-and-red, balck-slipped, and fine and coarse red ware. In fine red ware, the shapes were close to Malwa pottery.

I(C) —This is similar to I-B, but introduction of P.G.W. was anew feature. The paintings on grey ware resembled similar paintings found on the fine Painted Grey Ware, otherwise, the Grey ware sherds encountered in I(A) and (B) have no paintings, though the fabric and the shapes were the same. A few shapes in red ware showed incurved rims of bowls and dishes. In this level N.B.P. of fine variety appeared for the first time.

Antiquities found included lump of iron, terracotta collared bead, wheel, pendant and bangle pieces.

The total deposit of this period was of 1.03 m. In period - II (Maurya-Sunga period) : Grey ware was rare. The pottery resembled the usual Maurya-Sunga levels of north-Indian sites — exclusively red-ware of medium fabric with stamped design. A chocolate-slipped ware with incised designs was also found in this period which continued in the subsequent periods.

The antiquities included terracotta objects such as bull, bead and ball; stone ball, and incised stone plaque, iron nail, a miniature iron post and a lump of iron, shell bangle piece, and carnelian bead, Sunga terracotta was also found.

Period III (Kushana Period) was prominently associated with bowls, sprinklers, knobbed lids and jars sometimes spouted with stamped designs. The antiquities consisted of terracotta.

Period IV (Gupta Period) was characterized by the ususal Gupta Pottery of north Indian sites. The find of a multiple oven was an important evidence of the activities of the contemporary people. The antiquities of the period consisted of terracotta glass, ivory and quartz objects. Period V (Post-Gupta Period) revealed typical antiquities.

Loose sculptures and remains of a temple of 10th-12th century A.D. existed at the eastern end of the uppermost flat area of the mound.

43. Excavationa at Pipilya Lorka, District Raisen.— The Department of Archaeology and Museums, Government of Madhya Pradesh, resumed excavation in continuation of the earlier work at the ancient mound of Pipilya Lorka.

The excavation in the four trenches PLK IV, V, VI and VII not only confirmed the earlier cultural sequence of protohistoric times but also revealed clearly the stratigraphic position of the early historic and historic deposits.

Trench PLK IV, laid on the top of the 15 m high mound, revealed three cultural periods

viz. proto historic, early historic and historic in which altogether 23 layers in a deposit of 9.70 m down to natural soil were exposed. Trenches V and VI revealed only period I. Period I was chalcolithic in nature with a thick deposit of 5.50 m classified into three subphases;it yielded rich painted pottery with multichrome designs, copper strips, bangle pieces, antimony rods, microlithic tools made on chalcedony, chert, jasper and agate, comparatively less blades, points, fluted cores, crescents, and semi-precious stone lunates and semi-precious stone beads.

The period was also marked by the presence of floors with multiple hearths containing charcoal deposits.

The other finds from the deposit included animal bones with cut marks, bone points, stone balls, pestles, terracotta skin rubbers and stamps (pl. 43).

Period I was divided into three phases of which the earliest, i.e., phase I was characterized by water logged red ware, pale grey and burnished ware — sometimes painted with lustrous red ware. Thick grey ware with nail marks and incisions was also noticed. The painted designs comprised of matted square or diamonds, linear, bands,strokes, wavy lines, criss-crosses, arches and twisted bands. The types represented shallow and deep carinated bowls, jars and jugs with long necks, narrow mouths, globular bodies, conical bottoms, bowls and dishes on stand, spotted bowls. The pottery was mainly of thick and coarse fabric and showed Jorwe and Kaytha type painted designs with bands and shades.

Phase II revealed a slight change in the ceramic tradition which comprised of black and red burnished ware, coarse and dull red ware, painted in black, purple, red and white, and chocolate ware. Paintings occurred on the rims and the body which comprised of big matted blocks, diamonds, semicircular arches in row with vertical strokes, linear designs, white dots in circle or in triangle, tridents, angles, leaves, plants, birds and scorpions. Besides, there were also found some graffiti marked pottery by painted black on ochre or orange ware with mettalic sound and thin fabric, black and red ware bearing designs in white or purple red, lustrous black ware with graffiti marks, thin grey ware with paintings in purple and red slipped ware.

The types included undulated bowls, carinated globular bowls, vases and dishes with stands, beaked bowls and miniature pots. This phase represented the regional style of the Lorka complex. The orange ware formed the major pottery type.

The painted designs consisted of long troops, star, diamonds or vertical stroke, tridents, leaves, dots, linear designs, big bands, circle and arches. Throughout Period I copper tools were absent although microliths continued. The ochre red or orange black and red wares were present in almost all the three phases, but with variation in texture, fabric and types, percentage and nature of paintaings. Period II was represented by early historical pottery comprising black-and-red ware, ochre-red or orange ware, lustrous black ware and red slipped ware.

Period III yielded historical pottery and antiquities ranging from the Mauryan to the early medieval times. The ceramic industry was characterized by russet coated red ware, black and red ware without painting, red polished ware and a few stamped potsherds. Among the notable antiquities mention may be made of terracotta bulls, stone plaques, copper coins and stone sculptures.

44. Exploration in District Raisen.— G.L. Raikwar of the Department of Archaeology and Museums, Government of Madhya Pradesh, undertook exploration of the district Raisen and found three sites, viz. Kakrwa baramadgadhi, Madianiwari and Koluba yielding tools of mesolithic time.

45. Explorations in Districts Raisen and Sagar.— G.L. Raikwar of the Department of Archaeology and Museums, Government of Madhya Pradesh in the course of exploration discovered ruins of temples, fortresses, architectural and sculptural fragements and inscribed stones of late Medieval period from the sites appended below.—

District	**Village**	**Antiquarian remains**
Raisen	Khajuria baramadgadhi	Sculptures of Vishnu, Dik-pala, Ganesa, Siva, Kubera, Agni, Varuna, Surya, and Lakshmi-Narayana, door-jambs and lintels.
-do-	Kokalpur	Temple ruins-pillars archi-tectural members and ceilings belonging to the Paramara period; sculptures of Uma-Maheswara, Vishnu, Surya, Sura-Sundari and Dikpala; inscribed Sati stones date-able to c. fifteenth-sixteen-the A.D. and a number of inscribed tomb stones of the Muslim period.
-do-	Madianiwari	Sculptures of Umamahes-wara, Ganesa, standing male figure, nandi and Siva-linga.
-do-	Beguinganj	Remains of a fortress assign-able to *c.* fifteenth-sixteenth Century A.D.
Sagar	Bhabukabari	Sculptures of Vishnu, Ganesa, Mahishasura-mar-dini and Hanumana.
-do-	Hurraputguva	Sculptures of Ganesa, Mahishasura-mardini, Naga-nagi, Varaha, Hanumana and Stone inscriptions of c.

District	Village	Antiquarian remains
		fifteenth-sixteenth century A.D.
Sagar	. Khejramahi	Sculptures of Mahishasura-mardini and Vishnu
-do-	Mahunagujar	Sculptures of Ganesa, Dik-pala, Vishnu, Hanumana, Dasavatara panel and door-jamb.
-do-	Sagoni Umria	Inscribed Sati Stone of *c.* fifteenth-sixteenth century A.D.
-do-	Sherpurdarkoli	Sculptures of Uma-mahes-wara, Naga-nagi; door-jamb and architectural fragments.

46. Exploration in District Rewa- Phani Kant Mishra of the Central circle of the survey explored thirty-two villages in the Teonthar Tehsil of the district in the course of village to village survey. The sites, where antiquarian remains were noticed, are listed below: —

Village/Site	Antiquarian Remains
Arar	A small temple with paintings of king worshipping Lord Shiva *c.* eighteenth century A.D.
Chaura (near-tank)	Sculptures of Ganesha, Uma-Maheshwara and a Sati Stone
Chanana	Small temple of Kalachuri period
Chila (on the bank of river Tamasa)	Gupta and Muslim pottery
Farhadi	Structural remains and sculpture of Nandi
Ghuman	Ruins of an old Garhi (Fort)
Hardaha	Temple ruins of Kalachuri style
Majhiari	The fragments of brahamanical sculptures of Vishnu, Siva and architectural members
Malivar	Ajanta sculpture
Puranic Purva	Ruins of an old fort and paintings of later period
Rajpura	Extensive mound yielding Kushana, Gupta and Medieval pottery and a temple of Kalachuri style
Sahlolva	Medieval sculptures and Sati pillars
Satianchaura	Medieval sculptures and Sati pillars

Singarwar	Remains of Medieval structures
Sonauri	A small Gadhi with some dilapidated temple ruins of medieval period.

47. Explorations along the Banks of River Bina, District Sagar.— During the course of exploration, the Department of Archaeology and Museums, Government of Madhya Pradesh discovered a number of sites located ion both sides of the Bina River bank. These sites were surrounded by dense forest and rocky hills. The sites with their cultural remains are listed below: —

Village/Site	**Tehsil**	**Cultural Assemblage**
Behta Ali nagar	Sagar	Mesolithic tools
Gajkhera	-do-	Palaeolithic and Mesolithic tools
Gauiri	-do-	Palaeolithic and Mesolithic tools
Lalbag	-do-	Mesolithic tools
Nayakhera	-do-	Palaeolithic and Mesolithic tools
Sherpur-darkoli	-do-	Palaeolithic and Mesolithic tools

48. Excavation at Udayapur, District Vidisha.— In continuation of the previous work, under the guidance of D.K. Sinha of the Central Circle of the Survey assisted by A.K. Pandey and P.K. Mukherjee, the excavation at Udayesware temple was taken up.

The temple which interestingly marks the culmination of the art and architecture of the Parmaras of Central India is dated around A.D. 1059 according to the inscription traced on the temple wall.

The work was mainly concentrated on the two sides, viz. western and southern. The excavation on the southern side revealed a flight of steps and niche on either side. These niches were carved with the figures of Ganesa and female attendants. The sculptural representations from the site exhibited head of Ganesa, Mahishasura-mardini, Parvati, a Jaina Tirthan-kara and flying Gandharvas.

MAHARASHTRA

49. Exploration in District Gadchiroli.— S.N. Raghunath of the South-western Circle of the survey discovered a Chalcolithic site on the Wainganga River near the village Thameshwansa in Mul-Taluka. In the section of the river, one can see the remains of ancient copper workings now under the cover of vegetation. The exposed green chloritised basic rock revealed

shafts. The pottery collected from this site included thin lustrous unpainted black and red ware having a generic affiliation to Rangpur **III.**

50. Excavation at **Bhagimohari, District Nagpur.— In** continuation of the previous year's work (1982-83, pp. 61-62), S.B. Deo of the Deccan College .Post-graduate and Research Institute, Pune and A.P. Jamkhedkar of the State Department of Archaeology and Museums, Government of Maharashtra resumed excavation at Bhagimohari. The site has habitational deposits as well as stone circle burials flanking the River Kolar. This season's work confirmed the habitational sequence and the burial mode as revealed in last season's excavations.

In the habitational area, having a total deposit of two metres and a half — all of mega-lithic culture—a trench, 5 m x 5 m was laid. In all, nine layers were exposed with five floor levels. All these floors were found to have been prepared by ramming black clay and fine sand over pebble beds and plastered over by lime. The most intact one was sealed by layer (4) at a depth of 1.50 m and representing the middle phase of occupation. The extent of floor exposed was 5 m x 2.5 m, plastered over by lime and having at its western periphery a clay wall destroyed in fire indicated by large chunks of burnt clay lumps mixed with hay and plastered externally. That the house was destroyed in fire was further evidenced by the find of a log of wood completely burnt down -and fallen on the floor close to the wall. The periphery of the wall was marked by a series of circular postholes (seven) with diameters ranging between 30 and 45 cms. Inside the house were located three circular bins of clay with a thickness of 10 cms and diameters ranging between 1.07 and 1.15 m. Remains of the horse-shoe shaped hearth were also recovered with lot of animal bones and grains (recovered by floatation technique) like rice, wheat, barley, lentil and pea.

Throughout the period of occupation, the inhabitants used painted black on red ware thin and burnished red and micaceous red wares. The exterior of the painted ware contained entirely geometrical designs. This ware shows no affinity in fabric or typology with any of the earlier chalcolithic or the early historical painted wares. The black-and-red ware comprises rimless bowls and dishes as also covers and knobbed lids. The micaceous red ware which is brittle in character, represents mostly urn-like vessels and basins, identical to those found in stone circles.

From the habitational deposits iron axes were also recovered along with cross-ring fas-teners, hoes, arrowheads, rings and fragmentary nail-parers and adzes. Bangle pieces recovered (Pl. 44).

Animal bones collected in large quantities consist of bones of pig, cattle, horse and fair number of birds. Scores of cattle bone ware found to have been worked upon and flaked to attain a sharp point.

Besides the habitation, two stone circles — one each in locality V and VI were excavated. The diameters of these ranged between 17.75 and 14 m and one stone of each circle was found to contain cut marks. The one in Loc. V was characterized by a centrally placed huge Gond-wana slab, a feature peculiar to Bhagimohari stone circles. These circles yielded iron objects like chisels, nail-parers, axes with cross-ring fasteners, adzes, spearheads, spikes, hoes, ladles

with straight handles and beads of carnelian and res jasper. The pottery comprised mostly, of the micaceous red ware and the black-and-red, both similar in fabric and typology to those encountered in the habitation. No painted pottery was found in the burials here. Another distinctive find was a group of twenty-one copper bangles found around the forearm bone Not a single skeleton was reported although fragmentary human bones and teeth were recovered, indicating probably partial or secondary burials.

The recovery of grains, painted pottery and remains of a house in the megalithic context were the significant aspects of this season's work. Further the identity of objects of iron and copper and the typological similarity of pottery found in habitation and burials was also noteworthy.

51. Excavation at Kandhar, District Nanded.— M. K. Dhavalikar, of the Deccan College Post-graduate and Research Institute, Pune in collaboration with A.P. Jamkhedkar, of the Department of Archaeology and Museums, Government of Maharashtra conducted excavations at Kandhar.

The excavation was carried out in a cultivated field at Manaspuri, 2 km from Kandhar, where a few fragments of a giant statue were found sometime ago. Excavation revealed the remains of a unique stone structure which is human shaped (22 m long and 7 m wide) and is enclosed by a double stone wall (37 m x 33 m). It is provided with an entrance on the east. It is for the first time that such type structure has been found in the subcontinent and it answers well to the description of *Vastu-purusa* given in ancient *Silpa* texts which often compare the dwelling of the god with the human body (*purusa).* Thus far it was difficult to visualize a human shaped temple, but the description of the texts is now corroborated by the discovery of such a structure at Kandhar.

The structure is built of dressed stones in mud masonry, the intervening space being filled in with pebbles. The maximum length from head to toe is 23.05 m and the head portion, which is in the north-west, is 6.35 m long and 4.85 m wide. The legs, which are in the southeast direction,are 10.88 m long and their maximum width at the thigh is 2.20 m. The hands are 9.95 m long; they are broad at the shoulder (2.05m) and taper down to 1.05 m at the extremity. The left-half of the head is considerably destroyed. Around the head was a pavement of stone rubble in mud masonry which is 0.88 m wide. Near the legs was noticed a circular pit, which is now full of fallen stones.

The temple is enclosed by a double *prakara* wall built of roughly dressed stones in mud masonry. However, it appears that the wall built of larger stones belongs to the earlier phase as the stratigraphical evidence suggests, whereas that of the smaller stone is later. In the eastern part the nature of the wall is different. Here the wall is 2.32 m wide and is faced on both sides with large dressed blocks of stone and the portion in between is rammed with stone rubble in mud masonry. In the centre of the wall the temple is provided with an entrance of which now only two steps have survived. They are 2.88 m long and 2.48 m wide. It is significant that the entrance is not located exactly in the centre of the human shaped structure. (Pl. 45) To the left of the structure on north is a bedding of stone rubble over an area measuring 10.40 m x

3.52 m and its top, on the west, was curved as is evident from the extant stone slab. Probably the image of Yogeshwara was placed here.

A close examination of the sculptural fragments shows that it was not monolithic but was made in parts which were then joined together. The different parts have been provided with tenon and mortice holes, and the fact that even the underside of the feet is very meticulously finished suggests that the gigantic statue was placed in the structure in a reclining (sayana) posture. The structure has no roof over, but was open to sky.

The statue, the fragments of which have been found earlier at the site, can be identified as of Ksetrapala Bhairava, with a third eye on the forehead. It should be stated in this connection that stone inscriptions from Kandhar of the time of the Rashtrakuta monarch Krishna III (A.D. 939-65) refers to a temple of Ksetrapala, protector of fields, which was located on the outskirts of the city. The shrine unearthed in the course of excavations can therefore be identified as that of the Ksetrapala. The statue if complete, would have been the tallest (17 m) in the country. It has two hands, one holding a *khadga* and the other, a *bijapuraka.*

There are a few fragments of yet another statue from the same site which is smaller in size. This statue was probably that of Yogeshwari, the consort of Bhairava. She also holds a *bijapuraka* in one hand. The rubble bedding inside the shrine to the left of the main structure suggests that the statue of Yogeshwari was placed in a reclining position to the left of Bhairava.

MANIPUR

52. Exploration at Sajik Tampak, District Chandel.— The State Department of Archaeo logy Government of Manipur, under the direction of O.K. Singh assisted by S.R. Singh and T.A. Singh, Research students of the Deccan College. Post-graduate and Research Institute, Pune, discovered a prehistoric cave in the midst of thickly forested hill ranges near the Burma border to the east of the Manipur River. The site is about 900 m above sea level and is locally known as Songbu. It is in the shape of an arc and opens towards south-west. The roof slopes down towards north-east. The major portion of the cave floor is found disturbed. As reported by the villagers the cave floor was dug out for shelter during the Second World War, and only a small area near the south-western corner remains as original. A waterfall is passing over the roof on the north-west and falls just in front of the cave into a deep gorge. Exploration along the gorge and the disturbed cave floor resulted in the discovery of some stone artifacts consist ing of scrapers, borer-cum-hollow scraper, knife, flake-blades, and cores.

53. Exploration at Salangthen, District Churachandpur.— During the course of his exploration, O.K. Singh of the Department of Archaeology, Government of Manipur, discovered groups of megalithic monuments running in north-south direction at an altitude of 1105 m above M.S.L. on a part of the Thangjing Range. A few horizontal flat stones engraved with footprints and female genitalia believed to be of the wife of Rangngam, a hero of the Kabui Tribe, have also been discovered.

54. Exploration in District Ukhrul.— O.K. Singh of the Department of Archaeology, Government of Manipur, discovered megalithic menhirs at Nungbi and Jessami villages, two pairs of footprints of Maharaja Churchand and Budhachandra and a stone human head at Hundung village, Ukhrul.

55. Exploration in Khoupum Valley, District Tamenglong.— O.K. Singh of the Depart ment of Archaeology, Government of Manipur, in the course of his exploration, discovered a number of flat stones carved with footprints, gourd, crosslines and buffalo heads.

A small rock-shelter facing east, at an altitude of 907 m above M.S.L, was also discovered near Khoupan village. In front of the rock-shelter, there is an engraved flat stone site. Over and above this, number of big flat stones and erected stones having the characteristics of megalithic culture, were also found inside the Khoupum village.

A big rock-shelter at a distance of about 2.6 km from the Khoupum village to its north-west was also discovered. The shelter is in the shape of an arc, but the floor of the shelter is barren and covered with very thin layer of soil mixed with stone slabs fallen from the walls and roof of the shelter. There is a rivulet just in front of the shelter.

On the peak of the Khoupum hill (1263 m above M.S.L.) one more flat stone site was discovered. On one of the flat stones was engraved a female sex organ.

ORISSA

56. Exploration in Districts Balangir and Phulbani.— In continuation of previous sea son's exploration (1982-83, pp. 64-65) S.B. Ota, Research scholar of the Deccan College Post graduate and Research Institute, Pune undertook further explorations and covered the left banks of the Tel and the Mahandi, both banks of the River Bagh and Gudguda and Meherani, both affluents of Mahanadi. It revealed the following archaeological sites belonging to Mesolithic and Historical periods.

The Mesolithic sites on the left bank of the Tel were located in the reserve forest near Dhobabahali, Kustapali, Lakarma, Ramai and Tithipali; one site has been found at Paika-pal on the left bank of the Mahanadi. On the left bank of the Bagh, Mesolithic sites were discovered at Jamtangi, Saupara, north of Sobhapalli, Digi and south of Mundipadar, and on the right bank at Jamtangi, west of Chhelibahal, south-west of Talupali and west of the near Karadapara. Gudguda nullah has yielded altogether four Mesolithic sites (localities of which are distributed on both the banks) near the bridge on the nullah, west of Jamtangi, west of Jam-pali and south of the Talpadar-Burhikon road. The upper reaches of Meherani has yielded eleven Mesolithic sites (localities of which are distributed on both the banks) located at Santi-pali, Rabiri, Boulsingha-Sadanandapur road, Boulsingha, Tunimunda, Dhourakud, Gohirapali-Pachkhandi raod, Gohirapali, Bad Jharamunda, Selamal and Dolabali. Most of these Mesolithic sites are located close to the banks except in a few cases, like the reserve forest sites on the left bank of the Tel, Paikapali on the left bank of the Mahandi and Bad Jharamunda on the left bank of the Meherani nullah, which lie away from the river banks on the foot hill zones. All

these explored sites are of the open air type and associated either with a thick deposit of red-soil or with granite-gneissic outcrops. These sites consist of more than one locality and sometimes the number of localities goes up to five or seven. The assemblages mainly consisted of both heavy duty tools and microliths of same nature as found earlier in the area in district Phulbani. The present exploration confirmed that the Mesolithic sites found so far (in last three season's work) in both the districts, belong to one and the same culture-complex fixed on the basis of typological similarities in respect of the nature of sites and stone tool assemblages.

Historical sites have been located at Nuapali, Khameswaripali and two sites near Dadarpali on the left-bank of the Mahanadi; at Saupara (two sites), Konapara and Digi on the left-bank of the Bagh and at Makadiapadar and Dolabali on the right-bank of the Meherani nullah. Apart from these historical sites, exploration has also brought to light a historical site with the remains of a defence wall, habitational debris, and a stupa like structure within a meander on the left-bank of the Raul (a tributary of the Tel), 1.5 km east of the village Bhuanpara. The defence wall (about 400 m long, 25 m in breadth and 8 m in height) is oriented north-south connecting the river bank at both the ends. It is made up of large burnt bricks and river pebbles. The gateway to the habitational area is in the middle of this defence wall. Apart from this, a circular stupa like structure (about 40 m in diameter and rising to about 8 m from the surrounding level) made-up of bricks (42 x 28 x 12 cm) as well as pebbles has been found on the river bank, at the northern most limit of the defence wall.

57.. Explorations in Chitrotpala Valley, District Cuttack.—The Department of Archaeology, Government of Orissa in the course of exploration from Autuda to Kendupatna, a distance of about 10 kms noticed a number of Buddhist sites identified by the brick structures ranging in date from the eighth century to the fourteenth century A.D. Besides, a large number of Buddhist sculptures were also found at Kendupatna, Nagaspur and Kolanapur.

58. Excavation at Maragoda, District Kalahandi.— N.K. Sahu of the Department of Archaeology, Government of Orissa, in the course of exploration, noticed red-sand stone sculptures at Maragoda in Jonk valley, about 30 kms from Nanpara. The trial trenching of the mounds adjoining Ranimahal revealed structures with a drainage system dateable to *circa* eleventh-twelfth century A.D. Besides, lower portion of a ruined sandstone temple of Siva was also exposed. A beautiful image of Kartikeya and a copper coin of Kalachuri period were also recovered from the temple site assignable to *circa* twelfth century A.D.

Explorations in the Sunabeda plateau and the Maraguda valley brought to light four important sites potentially rich in historical and cultural antiquities. These sites are:

(i) Jumlagarh near Kharaldhas fall of the Jonk river;
(ii) Trisul mound 10 kms from Godhas on the left-bank of the Jonk at the slope of the Trisul hill;
(iii) The Mahal mound; and
(iv) The Ranimahal mound both (iii & iv) on the right-bank of the Jonk in the plain region.

Out of these four sites, the Jumlagarh is the most important one being the seat of political power of South Kosala in the sixth-seventh century AD. It was, however, considered proper to take up the work at this site after ascertaining the cultural sequence of the other three sites. So excavations were undertaken at the three sites — the Trisul mound, the Mahal mound and the Ranimahal mound simultaneously.

Excavations at Mahal mound revealed a double storeyed building having 12 rooms of different dimensions. The evidence obtained so far indicated that it was a Court House *(Dharmadhisthana)* of the early medieval period. The dias meant for the Judges *(Vyavaharaks)* is of very interesting construction. The back wall of the dias is designed in a weavy semicircular manner and is decorated with six marlon symbols. These symbols are noticed in the Ananta gumpha cave of the Khandagiri and also in the Parasurameswara temple, Bhubaneswar.

In front of the dias there is a rectangular hall 6.10 m x 4.60 m which was probably meant for the persons presenting the cases. As the court was being held in the first floor there are provisions for coming to this floor directly without going to the down floor. Two side chambers (each 4.30 m x 3.65 m) were being maintained with religious sanctity. In one of these chambers a small image of four-armed Vishnu (25 cms high) along with pedestal is found and from other chambers a pedestal (without image) and a small plaque having the lotus symbol have been unearthed. It appears that the swearing of the persons under trial was being held in these sacred chambers.

The interesting part of the building are the two prison cells for the culprits under trial having high walls (6.10 m in height), no entrance and without provision for light and air. Bronze anklets for chaining both the feet are found from these cells.

A copper coin of the Kalachuri king Jajalladeva (AD 1090-1120) has been recovered from one of the chambers of the court building and three pieces of heavy iron staff used by the guards are found in the guard room in front of the building.

At Trisul the first three tiers of the mound were systematically unearthed, the third floor being about 90 m from the bed of the river. A beautiful brick temple was found perched on the first two ridges. The main shrine consisting of the sanctum and the porch were on the second ridge, while the approach path and some other chambers of the temple were on the first ridge. Inside the *garbha-griha* (3.66 m x 3.66 m) was enshrined a *Sakti Pitha* (without Lingam) measuring 61 cms x 3.66 m and 9.16 m in height and around *the pitha* a *'Pradak-shirnapatha',* 76 cms wide has been built with great care. The porch is rectangular in size and eight small images (all femal deities) were found inside it. No images were found inside the *garbha-griha* excepting the *Saktipitha.* Beautiful stone pillars marked the entrances to the sanctum on three sides and they also hold the roof which was of flat type, but now found dilapidated.

Residential buildings built on square plan were unearthed to the left of the temple in the second ridge. The rooms were single bedded arranged around a big square hall. Many interesting articles including ancient coins, one sword, precious stones, iron buckles for horse or elephant were found from these chambers.

Climbing a flight of ancient steps one comes to the third ridge where another beautiful brick temple was brought to light from underground along with extensive residential buildings.

The rooms are found arranged in 'L' shape and are very finely built. Inside the sanctum of the temple an image of the goddess was found enshrined on a.beautiful pedestal which is about 1.25 m high. The goddess is two-armed and stands in *alidha* attitude (Archer's pose) facing right, while the lion at her feet faces left. There is an inscription on the pedestal in the script of the 5th century AD which reads *Maheswari Bhavada.*

In one of the chambers in the residential buildings close to the temple, is found a stone seal on which the name *'Dhimstiswara'* is deeply cut in the Brahmi of 5th century AD along with a gold stylus. The iron sacrificial post *(yupa stambha),* only the upper part of which is found, is very heavy and is shining without being rusted even after a lapse of about 1500 years.

The fourth ridge of the mound is archaeologically not important but the fifth ridge (500 ft) from the river bed which is an extensive plain land about two kilometres in length was a part of the monastery complex and was probably being maintained as the place of recreation and meditation.

The monastery consisting of temples, residential buildings and recreation was a gigantic complex built in five tiers. The antiquities recovered by excavation—coins, seals, architectural style, etc. clearly indicate its time. This is the earliest Hindu monastery so far known in India which is not later than the fifth century AD and is also having the name of one of its chancellors as found from his seal the *'Dhimatiswara'.*

This monasteary was probably built by some early king of the Nala dynasty. In the fifth century AD it was under the Nalas who were ruling from their capital Pushkari located near Umerkota in District Koraput.

Excavations at Ranimahal mound brought to light a huge hall (15.25 m x 12.20 m) having high walls about 6.60 m in height. Another adjacent hall of this dimension is now in underground. Both these halls were surrounded by large size double ramparts, about 1.25 m apart, and both these ramparts having been unearthed during excavation. There was also a big stone wall found running around the structure.

The purpose of these two big halls,which were found heavily protected, not clear. These look like Assembly halls and were probably being utilised for administrative and political purposes. One copper coin of the Kalachuri king Prithvideva, the son of Jajalladeva (whose coin is found in the court house) was recovered from the excavated site.

The court building of the Mahal mound and the two huge halls of the Ranimahal mound belonged to the period when the Kalachuri dynasty ruled over this region (from the middle of the ninth to the end of the twelfth century AD). The Ganga King Anangabhimadeva-III defeated the Kalachuris and occupied this territory by about AD 1220.

The halls in the Ranimahal are found to be in use as late as the sixteenth century AD.

59. Exploration in District Keonjhar.— In continuation of the last year's work, Pradeep Mohanty, Research Scholar of the Post-graduate and Research institute, Deccan College, Pune,

resumed exploration in Ghasipura and Harichandanapur Taluks of the District. This resulted in the discovery of twelve Mesolithic sites mostly in primary context. The majority of these sites are found in association with granie outcrops and a few are on the foothills close to the tributary rivers. The sites are Karadapal, Tikira, Noapara, Kachiladarah, Karadabani, Sanahudi in Ghasipura taluk and Palaspal (Rebna), Golibeda, Chilikadarh and Bhagamunda in Harichandanapur taluk. Four of these sites are quite large with the artifactual spreads measuring 100 m x 100 m.

Besides these sites, quite a few rock outcrops have yielded stray microliths and heavy implements. Although these spots may not be called sites in the conventional sense, their significance for interpreting the working of the Mesolithic cultural system cannot be ruled out.

The microlithic tools consisted of retouched blades, truncated blades, blunted backed blades, truncated blades, points, borers, crescents, triangles, trapezes, side scrapers, scrapers, hollow scrapers, pushplanes, knives, flake cores, blade cores, worked nodules and chips. Chert was the principal raw material found in most of the sites. Quartz, chalcedony and agate were also utilized for making the tools.

A few sites, viz. Karadapal, Tikira, Noapara, Kachiladarah, Karadabani, Sanahudi, Palaspal, Golibeda, Chilikadarah and Bhagamunda have yielded heavy-duty implements made of dolerite and quartzite in association with microlithic artifacts. The types included uni- and bifacial choppers, points, discoidal cores having steep marking edges, scrapers, flakes, lunates, knives and celts. The celts lacked finishing at the cutting edge.

60. Exploration in the District Sambalpur.— T.C. Sharma, H.C. Sharma, Bandita Medhi and P.Binodini Devi of Gauhati University and S.N. Ratha, P. Panda, N.K. Mahakud of Sambalpur University, Orissa, explored the valleys of the rivers Mahanadi and Kharla and discovered a good number of tools belonging to various cultural stages of the Stone Age periods.

The area between the main dam at Hirakund and the bridge over Mahanadi near the Hira-kund Railway station was the focus of investigation. On the left-bank of the river, the hill range locally known as Lakshmi Dungri, runs north-south. On the right-bank, another hill range, locally known as Barapohar runs parallel to Laksmi Dungri. The Mahanadi forms a big and wide basin between these two hill ranges. Because of a rocky gradient at this point, the river could not deposit much of its materials. However, some thin deposits were noticed. As a result of the construction of the dam and the controlling of the water flow, the river here is dry exposing the rocky bed.

A small hillock, locally known as Daridungri is located on the left bank in front of the Barapahar range. The Sambalpur University buildings are constructed around this hillock. Between Daridungri and Barapahar there lies a swampy area, which in all probability is a palaeochannel of Mahanadi. On either side of the palaeochannel at the foot of Daridungri and Barapahar a few scrappy and thin deposits of lateritic implementiferous gravel conglomerates in eroded form were observed. Early, Middle, and Late Stone Age tools of various descriptions were colleceted from these deposits. S.N. Ratha had collected many implements from this area earlier.

Later our exploration was extended to the -valley of the River Kharla, a tributary of Maha-nadi. The site is about 100 kms away from Burla. The focus of investigation is an area of about 4 kms situated at about 2 kms to the south of Kuchinda town. It has been observed that the River Kharla has formed two terraces. The lowest terrace (T 2) which is aggradational is formed by loose subrounded and rounded gravels. The height of this terrace is facially covered by sandy silt which forms a talus. Therefore, no section is available at this point to observe the stratigraphy. However, a runnel cutting across the terrace shows that the gravels were deposited unconformably over a fissured clay. In the runnel as well as on the loose gravel, handaxes, cleavers and cores were found scattered on the surface.

The terrace I (T), the height of which is 104 m, is inset on the terrace II (T_2). There is a big channel which passes towards the river by cutting across both the terraces. The top of the terrace is covered by concretised implementiferrous laterite and it is highly eroded. This is segmented by further gulley cuttings. At present, the terrace is occupied by the local people either for agricultural purposes or for quarying laterite blocks. It is extensive and the Kuchinda township is situated on it.

The gulley cutting exposed a few sections from which the stragigraphy could be viewed. At the bottom fissured or mottled clay is partly exposed over which a thin layer measuring 15 cms to 25 cms, quartz grits has been deposited. The laterite was deposited over this quartz layer and was implementiferrous. Choppers, handaxes, clevers were found in situ and also on the surface in this layer.

A classified inventory of tools (site wise) is given below:

	Name of the tools	**BPB**	**DDR**	**HKD**	**KCD**
	Lower Palaeolithic				
1.	Pebble tools	**20**	**1**	**20**	**22**
2.	Proto-handaxes	**x**	**2**	**2**	**21**
3.	Handaxes	**16**	**4**	**x**	**86**
4.	Cleavers	**3**	**1**	**x**	**2**
	Middle Palaeolithic				
5.	Scrapers	9	4	x	x
6.	Cores	5	x	x	2
7.	Points	3	x	x	x
8.	Flakes	7	5	13	2
9.	Chunk	4	x	5	4

Name of the tools		BPB	DDR	HKD	KCD
	Upper Palaeolithic				
10.	Blade Flakes	3	x	x	x
11.	Burins	2	x	x	x
	Mesolithic				
12.	Scrapers	27	4	10	x
13.	Points	7	x	. x	x
14.	Bladelets	10	x	4	x
15.	Fluted cores	4	x	x	x

61. Exploration in the Upper Brahmani Valley, District Sundargarh.— Pradeep Kumar Behera, Research Scholar, of the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, undertook exploration in the upper Brahmani Valley and its tributaries and brought to light sites of various categories, viz. Palaeoltihic, Microlithic, Neolithic and magalithic.

Tools of the lower Palaeolithic phase were collected from the valley of the Brahmani, the Sankh and the Deo nullah, a tributary of the River Koel. They represent handaxe, mostly partial, cleaver, chopper and chopping tool, all made on quartz or quartzite. A major portion of the tools was found in gravel beds. They are mostly rolled and thickly patinated. Stratified deposits were noticed at Garjan on the right-bank of the Brahmani, about four km south of the Panposh railway station. The 2.40 m thick cliff section consists of compact yellowish sandy-silt, sandy-cobble deposit, compact sandy-gravel, sandy-cobble deposit, coarse sand of reddish colour, sandy-cobble deposit and lastly, kankary reddish-brown sandy-silt from bottom upwards. Two choppers were found *in situ* from the middle sandy-cobble deposit.

Another cliff section of approximately 3 m thickness was noticed near Jhirpani on the left-bank of the River Koel, about half a km west of the township. The lower part of the section is composed of alternative banks of fine gravel and coarse sand, which also yielded a few yellow patinated Middle Palaeolithic artifacts. Similar type of tools were also collected from the gravel beds and surface at Keutanposh and Riu, and also from a rain gully near Garjan.

A full-fledged blade industry, comparable to the Upper Palaeolithic industries of the subcontinent to a certain extent, was discovered for the first time in the Sundargarh district at Brahmanimara, south of Jangla. The collection included one hundred and thirty-nine blades, sixty-six bladelets, two hundred and six flakes and eighty-three blade/bladelet cores. Among the finished tools mention may be made of retouched blades and flakes, a few burins, backed bladelets, lunates, two awls and a solitary triangle. However, the stratigraphical horizon of the industry could not be determined, as it was found on the surface of a series of subdued

mounds.

Hundreds of microliths unassociated with pottery were found at many sites mostly on the surface of compact reddish brown weathered sandy silt deposits. Important sites are Misankund on the Koel, Vedavyasa on the Brahmani, Jhirpani on the Koel, Shivgudighat **near** Bisra town and Pitamahal. The distinctive types are blunted backed blades and **bladelets,** lunates, micro-gravette points, borers, burins, a variety of side and end scrapers and a **solitary** trapeze. Typical geometric forms are altogether absent. The artifacts are made of metamorphosed shales and milky quartz.

Some neolithic sites, characterized by the occurrence of ground stone axes, chisels and ring-stones, were found at Riu, Misankund, Jakeikela, Garjan and Brahmanimara near Jangla. At Garjan and Jakeikela a black burnished pottery was also encountered. The site of Jangla is particularly noteworthy, as it has also preserved evidence for some megalithic monuments.

PUNJAB

62. Excavations at Sunet, District Ludhiana.—The Department of Cultural Affairs, Archaeology and Museums, Government of Punjab, carried out excavations at Sunet during the season, under the direction of G..B. Sharma assisted by K.K. Rishi, Kuldip Singh Sidhu, Yog Raj and Ranjit Singh. Sunet (30° 50' N. Lat. 75° 50' East long) lies about 6 km from Ludhiana bus stand and about one km south from Ludhiana—Ferozepur Road. The present village is inhabited over an ancient mound.

The place has been referred to in literature as *Sunetra,* after one of the three sons of Dhritarashtra of Kuru dynasty. The excavation revealed six cultural periods as under:

Period I -	Late Harappa, *c.* 1800-1400 BC
Period II -	Painted Grey Ware, c. 1000-600 BC
Period III —	Black-slipped ware, grey ware and associated red ware, c. 600-200 BC
Period IV -	Sunga-Kushana, *c.* 200 BC-AD 300
Period V -	Gupta, *c.* 300-600
Period VI -	Early medieval, *c* 600-800

Trenches were laid on the south-western side of the mound named SNT-II. Three trenches viz. D, D-I and C-I measuring 6 x 6 m were taken up for excavation. Period I is represented by a thick, sturdy red and wheel made pottery comparable to those recovered from Period I at Sanghol in district Ludhiana and Bara in district Ropar. The shapes comprised of rims of jars and vases. As the area excavated was limited, no structural remains or antiquities were noticed. (Fig. 7).

Period II was characterized by the Painted Grey Ware pottery besides a Bara ware, black-slipped ware and associated red ware.

Period III with a total deposit of 2.25 m yielded black-slipped, grey and associated red wares. The types included straight edged bowls, incurved dishes, vases, jars, knobbed lids

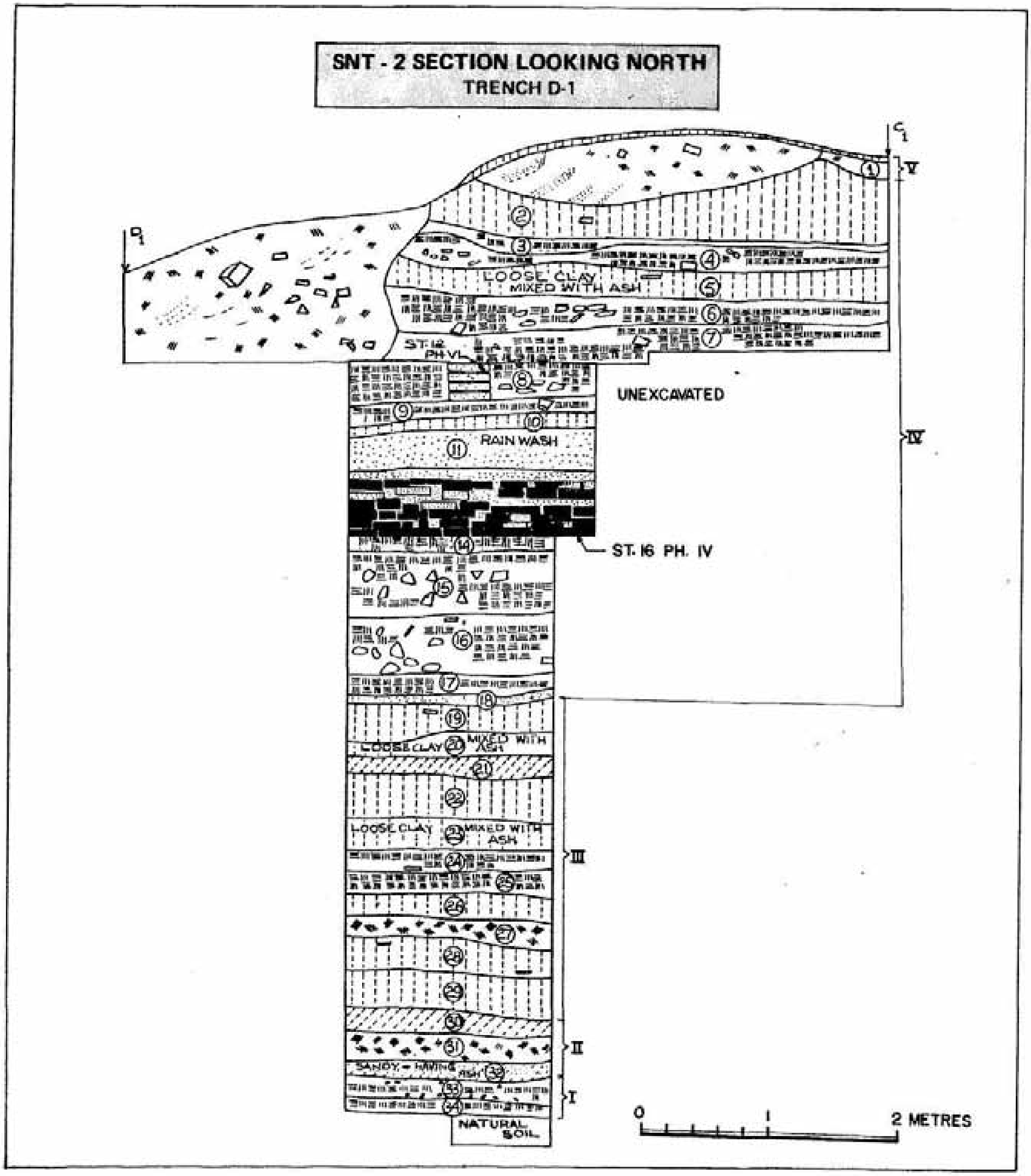


Fig. 7. Sunet : Section looking North trench D-1.

and miniature vases. Notable antiquities consisted of terracotta beads, balls, bangles, bone stylii and terracotta seal bearing legend "naga danasa" assignable on palaeographic grounds to *c.* second century BC. Towards the last phase of this period, some structural activity was noticed. They probably lived in thatched huts. Only one mud brick (size 33 x 24 x 7 cm) structure was encountered.

Period IV comprising of a thick strata revealed extensive habitational activities in three trenches of the site marked SNT-I and SNT-II. In all, seven structural phases were noticed in SNT-II; of these only phase six yielded houses made of mud and burnt bricks. One house was noticed having a living and a storage room, a kitchen with a chullah and paved floor of sun dried bricks (38 x 23 x 6 cm). Among notable antiquities mention may be made of late Kushana copper coins, ivory chessmen toy cart wheels, bone stylii, iron spear-heads and knives.

Excavations at SNT-I, also called Rani-ka-Bagh, revealed seven structural phases in fourteen trenches. In phase IV, a complete house plan was unearthed. This included a *deori* towards north-east, a compound in the middle, stairs, two living rooms on the back side, a kitchen having a fire altar, bathroom with a small water tank, and a storage room for grain. This house made of baked bricks (33 x 21 x 5 cm), was renovated twice and had an elaborate drainage system. There is a small platform (2.85 x 1.45 m) in front of the main entrance to the house. The walls were plastered. On other three sites adjoining this house there were mud-brick houses which appear to be servant quarters. The pottery types included incurved bowls. Antiquities recovered were terracotta beads in different shapes and sizes, beads of semiprecious stones, ivory and terracotta bangle pieces, rectangular polished bone pieces with carved circular designs with single, double, triple and quardruple marks probably used as dice, copper rods, terracotta incense burners and sprinklers, a bone stylii, copper coins and terracotta inscribed seals and sealings belonging to Kushan and late-Kushan period (Plate 46 & 47). A terracotta seal with a figure of devotee in front of a deity (?) was an important discovery. Moulds of medals and coins of Kushan Kings Vasudev and among Huvishka were other finds.

Period V was distinguished by the occurrence of red polished ware of the Gupta period. Three terracotta seals bearing legends 'Sankarnarvanabhyam' and terracotta beads in different shapes were recovered-Period VI encountered at SNT-1 was characterized by a large number of 'Kota' coins, dull red slipped pottery. The houses were constructed of re-used bricks. A terracotta female figurine (Plate 48) was recovered shown wringing her long curly hair after bathing. Other antiquities included ivory bangle pieces, terracotta balls and beads, beads of semi-precious stones, etc.

Site No. 3, situated between Satgurnagar and Bhai Randhir Singh Nagar, locally known as Pre-Da-Khuh,yielded numerous coin moulds of Yaudheyas from the surface. The site appeared to be the mint site of Yaudheyas, the tribal republic, who held their sway in the region during the earlier centuries of the Christian era. A hoard of thirty thousand coin-moulds with a figure

of Kartikeya and the legend *'Yaudheya Ganasaya Jaya'* on the obverse while his consort Goddess Shasti on the reverse (plate 49) was noticed. These coins were probably issued for commemorating, the victory over the Kushanas. However, the Kushan currency continued in the territory ruled earlier by Kushanas.

Site No. 4 was on the south-west side of the village in I-Block of Randhir Singh Nagar. From surface exploration a large number of seals and sealings, coin moulds and moulds for the manufacture of ornaments were found. The excavations of this site have resulted in the discovery of hundreds of seals and sealings with different legends in Gupta Brahmi characters. Some of the legends read as:

Dharam-Kartavya,
Datavya-Bhotavya,
Sataya Vakatavya,
Shri Dharamsva, and
Sidhirastu (Plate 50)

A large number of coin-moulds of the last Kushana King Vasudeva were also recovered.

RAJASTHAN

63. Explorations in Devka, District Barmer.— M.C. Joshi of the Survey noticed an old temple complex in a small village named Devka in district Barmer. Situated close to the main road between Jaisalmer and Barmer it is about 69 km from Barmer.

The temple complex comprising four shrines was in a ruinous state but architecturally quite interesting on account of its plan and elevation. On stylistic grounds, it could be dated to 14th century AD. Almost all the loose images from the temple were either stolen or removed but whatever survived was of immense artistic significance.

The main shrine, which was built over a *pitha* and *upapitha,* faces east and had a *pancha-ratha* plan with a well decorated *Nagara sikhara* in local style. The main cella was confronted by a pillared *mandapa* with foiled-struts. The *mandapa* itself was approachable through three flights of steps, and near the frontal comers of the *pitha* were built two subsidiary shrines, *pancha-ratha* on plan, of which one was originally dedicated to Siva. There was no image in the cella but on the basis of the deity carved on the *lalata-bimba* the main shrine must be dedicated to Surya.

Opposite the main temple on the east was a shrine dedicated to Vishnu which also had a *pancha-ratha* plan with a small *mukha-mandapa.*

In between the *pitha* of the main temple and Vishnu shrine, was a *dhavaja-stambha,* similar to medieval *Manastambhas* of Jains, depicting on its capital figures of Govardhana-dhari-Vishnu, Surya, Siva and Ganesa.

The main shrines of Surya and Vishnu were in a fair state of preservation but its *pithas* and *mandapa* are in a dilapidatory condition. The domed roof of the *mandapa* was damaged, and pillars were in almost dislocated state.

64. Exploration in Districts Bhilwara, Jaipur, Jaisalmer and Jodhpur. — The Department of Archaeology and Museums, Government of Rajasthan under the general supervision of Vijai Kumar, explored the following sites. A table listing the sites and its cultural assemblage is mentioned below:—

District	Site	**Cultural Assemblage**
Bhilwara	Bhilwara	Chalcolithic
-do-	Kachula	-do-
-do-	Lachura	-do-
Jaipur	Bilwari	Early Stone Age
-do-	Naraina	Pratihar Period
-do-	Narera	Copper Age
-do-	Sambhar	Pratihar Period
Jaisalmer	Bhojka	Early Stone Age
-do-	Kalau	Late Stone Age
-do-	Moomal Ki Meri	-do-
Jodhpur	Dhadhania	Copper Age

65. Excavation at Ganeshwar, District Sikar.— In continuation of previous work, the Department of Archaeology and Museums, Government of Rajasthan, Jaipur, resumed the excavations under the direction of Vijai Kumar. Seven trenches were laid out, three on the mound no. 3, two on the mound no.4 (on the eastern slope of the hillock) and two on the mound no. 5.

The excavation revealed a cultural deposit of 1.40 m with the characteristic copper age cultural material. The site represented by the copper implements included arrow and spear heads, chisels and fish hooks, razor blades, rings, bangles, hair pins, antimony rods, etc. One of the most important finds was, however, a double spiral headed copper pin having parallels in West Asia and Central Asia during the third millennium BC. The site also yielded microliths made of microblades, large blades, scrapers made on flakes, burins and blunted back blades, obliquely truncated and/or blunted back blades, points, lunates, triangles and trapezes.

The pottery was represented by two distinct traditions: thin dull-red ware having paintings in black with white strokes, akin to the Pre-Harappan Sothi tradition. The other group of pottery was sturdy red-slipped ware with characteristic paintings. The Ganeshwar pottery complex included a variety of shapes, the majority of which conformed to the types reported from other important Copper Age sites, in India. These may be classified broadly into six main categories: (1) storage jars, (2) vases, (3) basins, (4) bowls, (5) lids, and (6) miniature pots. Of these, the vases in which vertical handles were attached between the rim and shoulder deserved special mention. In one bowl a set of feet was attached to its base, while a few big basins had horizontal or vertical handles attached just below the rim on the either side.

A preliminary study of the available bones revealed three groups of animals (1) animals which were in the process of domestication like cattle, sheep and goat, swine, dog, ass, camel and fowl, (2) animals that lived in the houses or in the vicinity of township like hog, shrew, rat, etc. and (3) wild animals including those hunted for food like Nilgai, antelope, deer, hyena, wild bore, wolf, comb duck, hare, rabbit and fresh water fish. In case of the bones of cattle, fish, fowl, sheep, goat and wild animals, a number of them bore cut marks, besides being occasionally charred, pointing to their use as food. Evidence for extraction of bone marrow from various bones was also observed.

The structures at Ganeshwar included mud-platforms with partitions, storage pits and houne floors with post-hole. Deposits of burnt material over the floors appear to be an indi-. cation of fire at various levels of occupations.

66. Excavations at Didwana, District Nagaur.— In continuation of last year's work (1982-83, p, 68), S.N. Rajaguru, Hema Raghavan and R.K. Canjoo, of the Deccan College, Post-graduate and Research Institute, Pune and Claire Gaillard of C.N.R.S. France, carried out detailed Geoarchaeological studies of the primary Palaeolithic sites (Early Acheulian to Middle Palaeolithic) around Didwana in district Nagaur. Several trial trenches (2 x 2 x 2 m) were taken up in the Quaternary deposits exposed between 16R point and Sing-Talav, km west-south-west of Didwana in order to understand the stratigraphical correlation of various Aeolian litho-units of 16 R trench and the calcareous loamy deposits of Singi-Talav (1982-83, p. 69). In extention of the earlier trench, a small area (8m) was exposed carefully in the calcareous loamy deposit of Singi-Talav with a view to understand the nature of Acheulian occupational level which had been established in the last three years of work.

A reconnaissance survey of the late Neogene and Quaternary deposits was carried out in Nagaur, Churu, Sikar and Bikaner districts of Rajasthan.

This year's field studies have brought to light the following salient features of Palaeo-environment and Palaeolithic cultures of the area.

1. Excavation in the calcareous loamy deposit of Sing-Talav revealed the presence of Acheulian tools in the top of layer 5 while in the past three field season's work these were confined to the base of layer 4. Further excavations in layer 5 and even in the underlying part of the calcareous loam may hold in-locating basal Acheulian levels in this area. The layers 3 and 4 were found to contain a relatively higher proportion of small (2 to 5 cm) rolled artifacts and were considerably disturbed by natural agencies such as colluvial wash, surface flow of water, etc. It, therefore, appears that the southern limit of the Acheulian occupation ends somewhere near this year's (1984) trench.

2. Trial trenches between 16R point and Singhi-Talav revealed yellowish brown calcareous dune sand. Unit II of 16R, was contemporary with the upper part of Amarpura Formation which has yielded Late Acheulian and Early Middle Palaeolithic artifacts in this area. It can be suggested that the stabilized surface of yellowish brown dune was occupied by late Acheulian/Early Middle Palaeolithic man when the water level in the area was at least 7to 10 m

higher than the present water level in the interdunal pools or salinas.

3. On the basis of observations made in the dug wells around Didwana, basal reddish brown dune (unit III of 16R) appeared to be partly contemporary with the Acheulian occupation at Sing-Talav . By and large, Early Man occupied either the stabilized dune surface or shores of interdunal pools or the footslopes of hills around Didwana since the Middle Pleistocene.

4. Study of a large number of wells dug to a depth of about 40 m and the tubewell data in eastern and south-eastern parts of Nagaur district revealed that the Quaternary sediments to a depth of about 50 m or little more consist mainly of Aeolian sand, reworked Aeolian sand by fluvial processes and calcareous loamy deposits. This area, designated as Didwana-Kuchaman block, witnessed weak fluvial and strong Aeolian activity during the major part of the Quaternary.

5. On the other hand, evidences for strong fluvial drainage in Merta and Bikaner blocks were represented by thick (20 to 25 m) ferruginized cobbly, pebbly quartzite gravel beds around Bikaner. A few fossil wood fragments were found in the upper portion of the gravel bed, 1 km south-west of Bikaner on Bikaner-Nagaur Road.

6. Surfacial fluvial and fluvio-lacustral deposits of Late Neogene and Quaternary age occurred to a depth of 200 m in the Bikaner basin and to a depth of 150 m in the Merta basin. Study of a large number of bore well data collected from the Ground Water Department of Rajasthan, showed that the post-Eocene history of Thar was dominated by continental geomophic processes. The Bikaner basin was probably receiving sediments both from the Himalayas and from the Aravalli watersheds. On the other hand, the Merta basin preserved old channel gravels of the Luni and its tributaries, originating in the Aravalli mountain range.

7. Neotectonics and climatic changes of the Late Neogene and Quaternary can explain the morpho-dynamic history of this part of the Thar desert.

8. A few Middle Palaeolithic artifacts consisting of scrapers and flakes on siliceous hematitic rock were discovered on the surface of the conglomerate bed of Tertiary age near Kolayat, 50 km west-south-west of Bikaner on Bikaner-Jaisalmer road.

9. A rich Mesolithic site on the stabilized surface of the dune was located 8 km south of Bikaner on Bikaner-Nagaur road. Along with the microliths on quartz and chert, a good number of semi-mineralized and charred bone fragments were also collected.

10. It appears that the Acheulian (Early to Late) sites were confined mainly to the semi-arid eastern margin of the Thar desert (e.g. Didwana, Jayal, etc.) while Middle Palaeolithic sites occurred even in the western arid parts of the Thar. Mesolithic sites of the Early Holocene age were abundant in the entire Thar desert.

11. Field as well as laboratory observations indicated that the Thar desert enjoyed subhumid climate during the Late Tertiary and the Early Pleistocene. This was indicated by ferruginized gravel beds of Bikaner and Jayal-Ambali (40 to 45 km west-southwest of Didwana).

12. Predominance of Aeolian sand, interdunal evaporites and calcareous layers up to a depth of 50 m below the present surface in Didwana-Kuchaman area, and presence of aridisol characters in buried soils around Didwana indicated that the climate changed from arid to

semi-arid and vice versa for several times since the Middle Pleistocene.

Future detailed Geoarchaeological and Geochronological studies in this part of the Thar desert will help us in revealing the changes in behaviour of south-west monsoons for the last 1,00,000 years or so.

67. Explorations in District Nagaur.— The Art Survey Branch of the Department of Archaeology and Museums, Government of Rajasthan, under the direction of Prakash Bapna, surveyed the villages in Tehsil Merta, District Nagaur. The most important finds were frescoes pertaining to Jain mythology dated VS 1904 in a Jain temple of twelfth century AD. These frescoes are ascribable to the Jodhpur school of Painting on the basis of their style and character of the dresses. A number of sculptures belonging to VS 1677 and seventy bronzes of early and late medieval periods under worship in the Jain temple were also noticed.

68. Exploration in District Pali,— During the course of his exploration, R. Pathak of the Western circle of the Survey brought to light the following sites of archaeological interest:—

Taluk	**Site/Village**	**Cultural Assemblage**
Kharchi	Awa	Early medieval Siva temple, *sati* stones and a big tank
-do-	Banta	Medieval Vishnu temple, memorial *chhatris,* inscription and *sati* stones.
-do-	Baran	Medieval Krishna temple, *chhatris* and inscription.
-do-	Bhinwaliya	Medieval Vishnu temple, late medieval sites, inscription, *sati* stones *and jivit samadhi.*
-do-	Bithaura-Kalan	Late medieval Krishna and Jain temples, inscription and *sati* stones.
-do-	Chirapatia	Late medieval Siva temple, *sati* stones and inscription.
-do-	Dhamli	Medieval Vishnu temple and site, step-well, *sati* stones and inscription.
-do-	Dudhor	Medieval Jain, Vishnu and Siva temples and *sati* stones.
-do-	Gadana	Late medieval site, *sati* stones and inscription.

Taluk	Site/Village	**Cultural Assemblage**
Kharchi	Jadon	Late medieval Vishnu temples, *chhatris, sati* stones and inscription.
-do--do	Kadu	Late medieval Bhairava temple and *chhatri.*
.	Kharchi	Late medieval sculptures, *chhatris, sati* stones and inscription.
-do-	Manda	Medieval Saiva and Jaina temples, *chhatris, sati* stones and inscription.
-do-	Phulad	Late medieval site
-do-	Phulia	Medieval site
-do-	Ranawas	Medieval Siva temple, *chhatris, sati* stones and inscription.
-do-	Sandla	Late medieval Devanarayana temple, step-well, *sati* stones and inscription
-do-	Senwar	Medieval Siva temple, *sati* stones and inscription
Sojat	Bagrinagar	Medieval Siva and Vishnu temples, *chhatris, sati* stones and sculptures.
-do-	Bara Gudha	Late medieval Siva temple, inscription and *sati* stones.
-do-	Bhesana	Late medieval Jaina temple, *sati* stones and *chhatis*
-do-	Bilwas	Medieval Krishna temple, inscription, step-well, *sati* stones and *chhatris.*
-do-	Chandanwal-Nagar	Late medieval Siva and Jaina temples, inscription, *sati* stones and *chhatris.*
-do-	Chhitaria	Step-well, *chhatris* and inscription.
-do-	Dhanderi	Medieval Siva temple and *chhatris* around the Siva

Taluk	Site/Village	Cultural Assemblage
		temple.
Sojat	Dhakri	Step-well and *sati* stones
do-	Gagora	Medieval Vishnu and Jaina temples, inscription and *sati* stones.
-do--d	Guriya	Late medieval site
o-	Harinamali	Late medieval Vishnu temple and site,*chhatri* and *sati* stones
-do--do	Hiraiwas	*Jivit samadhi, chhatri,* sati stone
-	Kelwad	Medieval Durga temple and site, step-well, *chhatri sati* stones and inscription
-do-	Kharia Neev	Late medieval Vishnu temple and *chhatri*
-do--do	Kharia-Sarmianwan	*Jivit samadhi* and *chhatri*
-	Khoria	Late medieval small fort, step-well, *sati* stones and inscription.
-do--do	Lundawas	Medieval Siva and Lakshminarayana temple, *sati* stones and inscription.
-	Mundawa	Medieval Jaina temple, late medieval Lakshminarayana temple, *chhatris* and *sati* stones.
-do--do	Raira Kalan	*Chhatris* and *sati* stones
-	Raira Khurd	Late medieval site with a few structures of a fort, perhaps late medieval
-do--do	Reprawas	Step-well
-	Rupawas	Medieval Vishnu temple, step-well, *sati* stones and inscription.
-do--do	Saman-ka-Gudha	Medieval Siva temple
-	Sandia	Late medieval site, *chhatris, sati* stones and inscription.

Taluk	Site/Village	Cultural Assemblage
Sojat	Surainta	Medieval Siva and Jaina temples, *sati* stones and inscription.

69. Excavation at Zawar, District Udaipur.—The department of Archaeology and Ancient History of the M.S. University of Baroda in collaboration with the Hindustan Zinc Limited and the Research Laboratory of the British Museum, working under the direction of K.T.M. Hegde, carried out an excavation at Zawar. Assistance in this work was received from V.H. Sonawane and K..K. Bhan, K. Krishnan and Ajit Prasad, all of the M.S. University of Baroda, L.K. Gurjar of the Hindustan Zinc Limited and P.T. Craddock of the Research Laboratory of the British Museum. The principal objective of the excavation was to unearth the structural remains of ancient zinc distillation furnaces.

This ancient zinc ore mining and smelting site is situated in the Aravalli Hills, on the banks of the Tiri River, surrounded by dolomite hills, rich in sphalerite, a sulphide ore of zinc. There are numerous old mining pits around the site. There were extensive high heaps of debris built up of spent zinc distillation retorts, furnace fragments and ash, formed by the centuries of zinc smelting operations at the site.

A survey of these mines revealed that many of them were worked down to a depth of 120 m or more. Their deep shafts opened into many galleries following the natural configuration of .sphalerite mineral veins at different levels. Radio-carbon assay of timber supports found from one of these galleries at a depth of 100 m has given two dates for the zinc ore mining and smelting industry at Zawar. They are : 2120 60 and 1920 50 years before the present.

Excavation at Zawar has brought to light a series of impressive, nearly intact structural remains of the furnaces used in the distillation of zinc in antiquity. These structures and the retorts found in them enable us to reconstruct how zinc was produced in the past.

TAMIL NADU

70. Exploration in District North Arcot.- The Department of Ancient History and Archaeology, University of Madras, under the direction of K.V. Raman and assisted by S. S. Gurumurthy, P. Shanmugam, A. Swamy and Post-Graduate Students of the University conducted explorations in some parts of Vellore and -Gudiyattam taluks of North Arcot District.

Explorations revealed Black and red ware, black ware and red slipped ware of coarse variety from the following sites: Chennarayanapalli, Kosavanpudur, Kavanur, Senkunram, Melpatti and Kilpatti, which are lying on the road between Katpadi and Ambur, situated within a radius of about 10 km from Gudiyattam town. Further, Munkappattu and Pogalur

villages yielded a large quantity of the medieaval pottery. Besides, fragments of Neolithic celts were found at Chennarayanapalli.

At Pugalur, about 5 km from Gudiyattam town a herostone dateable to Parthivendrava-rman *(c.* AD 966) was noticed. This was perhaps the first of its kind belonging to the days of Parthivendravarman. It recorded the death of a Parantaka Munaiyar who was a native of the village Pugalur. Three more herostone inscriptions, dateable to the tenth century besides those of a later period were noticed at Chennarayanapalli, Sembedu, Kosavanur and Mankappattu. A series of eight herostones without any inscription were noticed at Munkippattu. All these depicted fighting scenes, measured 4x3'.

Rock paintings were noticed at the foot of the hill adjacent to the village Chennarayanapalli .near Gudiyattam town. The paintings were found on the ceilings and wall of a cave, depicting a hunting or battle scene. A row of horses with mounted riders or hunters brandishing swords and daggers was beautifully portrayed. A few men were seen escorting the horses. Generally, the body of the horse was painted with a square or rectangular profile. A few diagrams or totemic symbols were scratched in between the paintings. The paintings were executed in thick bright white colour. The finds of black and red ware in the vicinity of the cave suggested that the painting may belong to the megalithic times.

Medieval Chola temples with inscriptions were noticed at Kavanur and Senkunram. The temple at Senkunram was circular or plan while the other one at Kavanur was square.

71. Excavations at Kambarmedu, District Thanjavur.— In continuation of the previous year's work (1982-83, p. 72), the Southern Circle of the Survey under P. Narayana Babu, assisted by Shivananda Venkatrao, continued the excavations at the protected mound in the village Terezhendur, popularly known as Kambarmedu.

In order to confirm the cultural sequence obtained during last season's work a small scale excavation was undertaken. The results of investigations revealed that the site was mainly occupied by the early Megalithic people with some survivals of late Neolithic elements followed by the late Megalithic and early Medieval phases.

The vestiges of the early medieval period were highly disturbed but traces of brick walls, pits and abundant pottery of dull red ware were encountered together with terracotta objects.

The main types of pottery included bowls with flat base and featureless rims, vases with outcurved rims with impressed designs, decorated miniature bowls, carinated jar with a flanged rim, globular pot with wide flaring mouth with ridges on the shoulder and pots with rough surface indicating utilitarian types.

A soakage pit of mediaeval period with three courses of rings kept one above the other was another noteworthy feature noticed in the excavations (Pl. 51).

The antiquities found in this phase included large number of beads, plumb bob, ball, ear-ornament, hopscotches, cakes, bangle pieces and coins. The beads which constituted the major finds quantitatively were of different sizes and. shapes. Terracotta figurines such as a broken figure of Ganesa, headless female and a male torso were significant (Pl. 52). A large number of titles were also collected from the upper level.

The next occupational strata underlying this early medieval period was that of Megalithic deposit.

The early levels of this Megalithic period yielded black and red ware of thick section along with red wares and painted wares. A few handmade grey ware and painted red on red sherds which are the survivals of Neolithic elements were also encountered in this phase. Last year, along with this assemblage a Neolithic celt was noticed. Besides this, both slipped and unslipped varieties of black and red ware were also encountered. The types included vases with everted rim, carinated bowls and pot with a bulging body. The red ware bearing paintings in red was too fragmentary to determine the shape.

The Late Megalithic period yielded pottery of black and red ware and other associated wares which were thin in section and some of the specimens bore graffiti marks.

However, the site did not yield any evidence with regard to its association with poet Kambar, the author of Ramayana in Tamil.

72. Excavations at Palayarai, District Thanjavur.— To ascertain the archaeological potentialities of the site and obtain the remains of Chola palaces, systematic excavations were undertaken at Kilpalayarai by D. Thulasiraman, M. Senthil Selvakumeran and M. Rama-krishnan of the Department of Archaeology, Government of Tamil Nadu.

Palayarai, now in the Kumbakonam taluk of Thanjavur District, was the secondary capital city of medieval Cholas. Rajaraja II seemed to have stayed at Palayarai. Once a flourishing city now it is a small village having its original name Kilpalayarai. It is situated 7 km away to the south of Kumbakonam. The names of some hamlets around Kilpalayarai such as Nulaiyur (entrance to the city), Cholan malagai (Palace of Cholas), Rajendran pettai (named after Rajendra Chola), Nandan medu (mound of Nandan or Nandi) etc.. themselves indicated that they might have formed part of the royal city during Chola times.

Three trenches were laid out and numbered as PRI—I, PRI—2 and PRI—3.

Excavation of PRI—1, laid on the surface of the mound at the south-eastern side of Somanathaswamy temple, exposed only three layers of which Layer (1) ranging from 50 to 60 cms composed of loose brownish earth containing large number of potsherds, roof tile pieces and brick bats.

Layer (2) from 30 to 50 cms was not loose ashy soil mixed with brick bats, potsherds and tile pieces. Layer (3) is almost uniform throughout the trench and consisted of loose soil mixed with potsherds and brick-bats

Trench no. PRI—2 (5 x 3 m) was laid on the highest point of the mound which was to the south of the road from Kilpalayarai to Nathankoil. The excavations in this trench yielded medieval roof tiles and coarse variety of potsherds.

PRI—3: covering an area of 5 x 3 m, was laid to the north of the trench PRI—2. A brick wall with five courses of bricks, running east-west was unearthed at a depth of 85 cm. The size of the bricks is 24 x 12 x 4 cm. The eastern and western sections clearly showed that the brick wall was robbed in the later period. Two layers exposed in the trench yielded medieval coarse red ware, black ware sherds, painted and decorated sherds, rectangular roof tiles,

terracotta lamps and spouted knobs, etc.

Decorated red polished ware and painted potsherds were found in the excavations (pl. 53). Important antiquities comprised of a large number of iron nails varying from 2 cms to 5 cms in length, number of glass and shell bangle pieces, a heap of more than hundred terracotta lamps, terracotta spouted knobs, broken terracotta figurine and a terracotta *Kalas.*

73. Exploration in District Tirunelveli.— M. Raman Namboodiri of the Southern Circle of the Survey while carrying out village-to-village survey of antiquarian remains discovered a rock-cut cave at Ramalingapuram of Alangaraperi village, assignable to ninth-tenth century A.D.

74 Excavations at Gangaikondacholapuram, District Tiruchirappalli.— Excavation was undertaken by S. Selvaraj, K. Nedunchezhian and P. Gauthamaputhiran of the Department of Archaeology, Government of Tamil Nadu to unearth the Chola brick structure and also to assess the archaeological potentialities of the site.

In all twenty trenches were laid out which revealed brick structures, mortar floorings, big iron nails, flat tiles, porcelain potsherds, ivory and bone objects and a handle portion of a sword.

The structures with the foundation wall of 2.50 m consisted of thirty-seven brick courses. The bottom of the foundation wall was 1.38 m wide and the top was 1.10 m. The top was also coated with lime plaster. In one of the trenches on the top of the brick structure, a 35 cm thick mud formation mixed with brick-bats was noticed, which is covered by lime mortar. This peculiar type of construction appeared to be the second phase of the construction of the building.

Granite stone pillar bases were found at equal distance of 2 m in the foundation wall. The stones were probably used to bear the wooden pillars the existence of which was noticed in one of the trenches near the pillar base in decayed form. Large quantity of iron nails of various sizes from 2 cm to 27 cm in length were collected in all the trenches.

By the side of foundation wall another wall was encountered leaving a gap of 60 cm. The gap was filled up with rammed brick bats and sticky clay. The wall might have served as a support for the buildings.

The building seems to have had a very high roof covered by flat tiles. The contemporary Tamil work Kulothungan Cholan Ula describes the shape of the roof of the building at Chidambaram. The roof of the building looks like a temple car. The excavation also yielded six faced tiles which seems to have been used at the corners, of the roof of the buildings. Some mortar pieces painted in red, green and yellow have also been collected.

The royal palace also was built of burnt bricks. The ceilings were covered with flat tiles of small size laid in a number of courses in fine lime mortar. The pillars were probably made of polished wood, supported by granite bases. The granite pedestals with a small hole in the middle might have been used as sockets for the pillars. Iron nails and clamps have also been recovered from the site. In the reign of Vira Rajendra, Rajendra's third son, the palace at

Gangaikondacholapuram is referred to as 'Chola Keralan Thirumaligai' (Chola Keralan was one of the titles of Rajendra I). The same inscription mentions a few parts of the palace as 'Adibhumi' (the ground floor) Kilaisopana (the eastern portico) and a seat named Mavali Vanadirayan . Evidently the palace was multi-storeyed. An inscription dated in the 49th year of Kulottunga, referred to Gangaikondachola maligai.

75. Excavation at Kannanur, District Tiruchirappalli.— P. Arasn and K.S. Sampath of the Department of Archaeology, Government of Tamil Nadu carried out excavation at Kan nanur, located near Samayapuram in Lalgudi Taluk, with a view to exposing the water channel covered by stone slabs and to know its method of construction. Systematic investigations were taken up on the northern bank of the Pullambadi canal. A natural rock formation was noticed at a depth of 4 m which was cut for the construction of the water channel.

In trench KNR I structures made of brick and stone slabs covering the water channel were encountered. In order to trace the extent of the water channel another trench KNE—II was laid which yielded a sump well and a stone alignment. The cutting edges of the rock formation were noticed at a depth of 3.10 m in KNR—III.

The sump well noticed in the trench KNE—II at a depth of 2.30 m decreases in width gradually towards bottom like a funnel. Total depth of sump well was 4.30 m. The overall alignment showed that the sump was constructed over the water channel.

UTTAR PRADESH

76. Excavation at Fatehpur Sikri, District Agra.— In continuation of last year's work (Indian Archaeology 1982-83 A Review, pp. 89-90) the excavation at Fatehpur Sikri, a National Project, was resumed under Professor R.C. Gaur assisted by J.M. Siddiqui, K.K. Mohammed, Nasir Haussain Zaidi, Mohd. Shami Alam, Q.S. Usmani, Mohd. Anis Alvi and Mohd. Abid, all of Aligarh Muslim University.

The Work was undertaken in six areas viz.. near the Badshahigate, *Ibadat Khana* the quadrangle of *Daftar Khana,* southern part of *Turkish Hammam (Khushbu Khana),* a quardrangle of Diwan-i-am, leopard cell and horse stable (both on the northern part of the ridge) and in the area popularly known as (Abdur-Rahim Khan-i-Khanan's) house or *Ghoda Mahal.*

The significant work of the year was the location and excavation of a Christian Chapel which Akbar had erected just near his *Khwabgah* for the accommodation and the worship of Christian Fathers who had come from Italy and Spain to participate in the discussion at *Ibadat Khana.* The location of the chapel very near to the *Khwabgah* enabled the king to meet the Fathers on and often, without creating suspicion in the minds of the courtiers who were not favourably disposed to the Fathers. A door was made in the palace wall which admitted the Fathers into *Daulat Khana* (Royal Abode). As the Fathers could not get any peace there on account of its being near the Diwan-i-am, where hundreds of scribes sat in the forecourt Akbar removed the scribes from there. The place which was used as the chapel was formerly

the *Khushbu Khana* a place where perfumes were prepared and kept. Akbar did not dismantle this structure but made suitable alterations on the specifications given by the Fathers. As no definite trace of the church was visible, efforts were made to locate the *Khushbu Khana* and thereby the church near the door of the palace boundary adjacent to Diwan-i-Am, on the south side of the Turkish hammam just outside the boundary wall. A metalled road passed by it between the southern door of Diwan-i-Am and the *Daftar Khana* quardrangle. The excavation exposed two rectangular rooms measuring 8.60 x 5.10 m and 5.90 x 5.10 m and triangular room measuring 4.50 x 3.70 x 4.40 m. The first room had one door with a width of 1.20 m while the second room had three doors on the northern side. It was important to note that these doors were closed with bricks at a later period, to convert it into the Church. During the excavation seven small tanks of varying sizes ranging from 1.93 x 0.40 x 0.92 m to 0.35 x 0.30 x 0.20 m, an essential architectural necessity for preparing perfumes were also encountered. It was noteworthy that the furnace used for distillation with its iron pan (Diameter 0.60 m) in original position was also exposed. Below this furnace there was a small arched opening to feed the fuel. The biggest room with furnace on its southern side was on short pillars. The *Khushbu Khana* also yielded one big perfume bottle *(Zir-i-Itardan),* two small bottles and one marble-cork of a bottle. A copper coin of Akbar was also found from the trench.

On the northern part of the ridge on the slope near *Hauz-i-Shirin,* a site apprehended as leopard (Tendua) cell on the basis of certain references from *Akbar Nama* was also excavated. Two small square cells each side measuring 3.20 m with one entrance in each of 1 m width, was exposed. It was well-known that Akbar was very fond of keeping trained cheetas for hunting. The height of the structures from floor to ceiling was 1.80 m which is also indicative of the fact that the structure was nothing else but the leopard cell.

The horse-stable was traced on the northern side of the ridge behind the so-called mint and present Dak Bunglow. The clearance of the site brought to light pillars, stone-hooks to tie horses, and tanks for fodder and water. Altogether eleven such tanks were cleared.

Excavations were also done on the right-side of the Badshahi gate to ascertain whether there was any wall to segregate the common people from the emperor' when he went to offer Juma Prayer in the Jama Masjid. The excavation brought to light a wall measuring 12 x 1.35 m running east to west. The eastern end of the wall was robbed off. In the western direction the wall was also damaged and most probably it abutted the outer wall of the Jama Masjid, where it was divided into rooms against the wall. A few structures of later periods were also excavated in this area. On the left-side of the Badshahi Gate, the excavation in the *Ibadat Khana* complex started last year was also completed. The baulks were removed and the full structure was exposed.

A trench was also laid in the south-west corner of Diwan-i-Am to trace the alignment and continuity of the structure standing outside Diwan-i-Am At a depth of 3.55 m a small room measuring 2.86 x 2.64 m was exposed. Its floor and walls were nicely plastered with lime and shell, which in smoothness, whiteness and shine were remarkably similar to that of the bath complexes of the palace building. There were two arched niches in two walls measuring 0.96 x 0.65 x 0.29 m. In size these niches tally with those in the Hamik's hammam. These were built

with standard Akbari bricks measuring 0.25 x 0.23 x 0.5 m. This structure, stratigraphically earlier than the Diwan-i-Am was part and extension of the structure standing outside in the south-west corner of the Diwan-i-Am The room, the Hakim's bath and the so-called Atish Khana of Fatehullah Shirazi were probably built in the second phase of the construction work at Fatehpur Sikri. It appeared that the king dismantled a portion of it at a later stage when he decided to construct the Diwan-i-Am

Among the antiquities were, a copper coin, perfume bottles *(Zir-i-Itardans)* iron objects, marble-cork, stone objects including a grinder *(Chakki).* The pottery included Chinese, glazed, red, buff and black wares.

77. Excavations at Fatehpur Sikri, District Agra.— In continuation of the last year's work (1982-83, pp. 89-90) the excavation has been resumed at FPS II, with a view to exposing structures in the area which lies nearby the so-called Treasury building in between Chahar Suq and Diwan-i-Am The work was directed by H.K. Narain and L.M. Wahal assisted by C.P. Singh, S.K. Jain, B.B. Sur, Y.K. Sharma, Chiranji Lal and H.K. Kathpal of the Survey.

At the back of the shopping complex in FPS II, the excavation revealed the existence of two rooms in a row abutting on the exposed remains of a series of shops measuring 7.90 x 3.5 m and 2.95 x 3.5 m, made of dressed sandstones of the Mughal period. The walls and floors of these rooms were plastered with lime, the former contained niches possibly for keeping things of daily needs. Each room had an entrance at the south. It seems that shopkeepers who were having shops might have been using these rooms as stores to stock their merchandise (materials).

Near the present Booking office outside the Diwan-i-Am, there stands a pavilion of the Mughal period. The excavations in cutting FPS II revealed the stone paved courtyard on the south side of the standing pavilion. However, to the west of the pavilion, a pathway running from south to north direction about 15.55 m in length and 3.5 m wide was exposed. The thickness of the pathway seemed to be about 5 to 6 cm. The stone chips were properly dressed and set in mortar in such a way that the sharper ends remained below to provide smooth surface, more strength and stability.

The area which stands in front of the Treasury building in FPS II to the left of the side of the road running from Chahar Suq to Diwan-i-Am brought under excavations, had several flimsy structures of late Mughal period. A set of three rooms measuring 3.85 x 3.70 m and 4.20 x 3.70 m abutting the Treasury building was exposed. These rooms were built with rubble stones and had entrances at the north. Towards the northern end of the area on the berm of the road a set of three rooms, partly built with *lakhauri* bricks and sandstone rubble measuring 5.45 x 1.75 m, 2.95 x 1.75 m and 2.95 x 1.75 m were brought to light. Each room had an entrance with an attached verandah towards south measuring about 7.25 x 3.15 m and a courtyard. Attached to the verandah there was a small kitchen with a *kacha* drain to flush out the refuse water. A set of a bath room measuring 2.55 x 2.25 m, a toilet (Pakhana) with a pair of seats and a partitioned space for urinal, built with sandstone rubble was unearthed. Towards the western side of the area, a set of three rooms measuring 4.95 x 3.60 m, 2.20 x

3.60 m covered by a verandah, measuring 4.95 x 3.60 m was exposed. In the same area traces of a hypocaust structure were located. It contained bases of a semicircular pillar of *lakhauri* bricks, about 70 cm below the floor level with its wings having clay pipe to exhaust smoke.

Pottery recovered during the excavations included red ware, glazed ware. Some of the sherds of the Chines porcelain bear Chinese scripts (P1.54) and symbols on bases showing designs which represent mystic animals, land-scapes, floral patterns and a bearded man who seems to be a noble with an attendant. Pottery of red ware variety, in general, was almost of dull red colour and of a coarse and medium fabric. The entire pottery was wheel-made. Commonest shapes were bowl, flat dish, spouted and carinated vase and cup -shaped lid with cone like hollow knob in the centre. Fragments of *surahi* and *chilam* were also noticed. Decorations, such as stamped and incised patterns were also found. Glazed wares discovered were of two classes, one represented a whitish colour and of sandy texture, whereas the other represented the normal pottery fabric with a crackled glazed surface with painted designs. Blue glazed tiles were also encountered.

The Antiquities recovered during the excavations include copper coins, iron objects, fragments of glasses, bangles, terracotta figurines and a silver ring (Pl. 55).

78. Excavations at Sringaverapura, District **Allahabad.—** In continuation of the previous year's work (1982-83, pp. 91-92) excavations were resumed at Sringaverapura with a view to ascertaining further details of the tank-complex, under the National Project 'Archaeology of the Ramayana Sites' by the Excavations Branch-II of the Survey and the Indian Institute of Advanced Study, Shimla. The excavations were directed jointly by B.B. Lai and K.N. Dikshit, assisted by P.K. Trivedi, V.C. Sharma, R.S. Sharma, S.K. Sharma, L.S. Mamani, Birbal Sharma, J.S. Bisht of the Branch and S.K. Srivastava and K.K. Grover of the Institute.

In the channel which lay in continuation of Tank B at its southern end, the lowermost revetments were exposed upto the bottom, revealing 46 and 48 courses respectively on the western and eastern sides. Here a 2.17 m long and 0.70 m wide strip of a single course of burnt bricks was found connecting the bottoms of the above mentioned two revetments at the point of the commencement of the channel. The strips seem to have been built possibly to withstand the scouring effect of the flowing water, at this narrow point (Pl. 56).

Further south, an interesting circular complex having an inner diameter of 8.60 m and built of 53 courses of bricks was brought to light. It was provided with two retaining walls further up. The middle retaining wall which formed partly a circle and partly a rectangle on plan, was built of 34 courses of burnt bricks. Its eastern arm had partly collapsed, while of the southern arm only a few courses were extant, its major portion having been anciently robbed off. The topmost retaining wall had 20 courses of burnt bricks but its eastern arm had also partly collapsed. From the then ground level on the eastern side, represented by the top-level of the upper retaining wall, flight of steps, with directional changes and intermediary landings, led to a level hardly a metre above the bed of the circular chamber. The steps ware constructed by placing the bricks on their edges, while in the case of the landings the. bricks were kept flat (Pl. 57).

Sometime after the tank had been destroyed and abandoned, a prominent residential complex came into being in the southern area. On plan it revealed entrances, rooms, a corridor and a *chulha* of bricks. It had three structural phases and on the basis of associated pottery and inscribed material can be dated to the late Kushan period (Pl. 58).

While excavating the silt in Tank B two more wells were located viz. 3 and 4, in the tank bed. Well no. 3 located on the western side and having a diameter of 1.25 m, was excavated up to a depth of 1.40 m, without reaching its bottom. It yielded pottery, brick-debris, bone-pieces and decorated terracotta pestles. Well no. 4, on the eastern side appears to have been comparatively smaller, though its full diameter and other details could not be ascertained (Pl. 59).

Amongst the important finds, mention be made of a terracotta sealing each in Kushan and Gupta Brahmi characters (Pl. 60). Other terracotta objects included figurines of a goddess-with-child, probably *Hariti* or *Shashthi,* a yaksha, possibly Kuvera (Pl. 61), animal, bird and human figurines, votive tank, tablets with three incision, dabbers, discs with notched designs, decorated stamps, pestles, lamps, decorated wheels, chat-shaped and arecanut-shaped heads, gamesmen. A terracotta lamp *(diya)* with soot marks was also recovered from the tank. Other objects included a crystal pendant, glass and shell bangles, and an ivory handle of a mirror. The metal objects included coins, a handle of a dagger, beads, antimony rods and a bowl of copper; nails, spear-heads, knife-blades, arrow-heads, scissors, rods, and one each of sickle and hook blades and spatula of iron.

In SVP-1, the N.B.P. levels were further excavated for collecting radio-carbon and ther-moluminiscence samples for dating purposes. A burnt brick wall (3.40 x 0.90 m) running in a north-north-west to south-southeast direction was discovered (Pl. 62). The size of the bricks used were 42 x 21 x 7 cm, 35 x 23 x 7 cm, 37 x 22.5 x 7 cm. A few post-holes piercing through the burnt bricks suggested that there .may have been a thatched superstructure.

79. Exploration in Districts Pratapgarh and Allahabad.— R.K. Varma, V.D. Misra, J.N. Pandey and J.N. Pal of the Department of Ancient Indian History, Culture and Archaeology, University of Allahabad, conducted explorations in the districts of Allahabad and Pratapgarh.

Exploration in Bara sub-division of Allahabad district brought to light two mesolithic Microliths sites. Microliths made on chert and chalcedony were collected from the Sujawan Deo temple area on the right bank of the Yamuna. A rock-shelter viz. Bhaidpur in the same sub-division of the district was located which contains presumably considerable habitational deposit. No painting could be traced in these shelters but from the surface exploration in the rock-shelter, microliths made on chert, chalcedony and agate were recovered. They collected triangles alongwith backed and retouched blades.

In Pratapgarh district, in the Patti sub-division, a few more mesolithic sites were located. Among the important sites mention may be made of Pandari, Sarai-Rajai, Barahoopur, Dhakhauli, etc. Microliths were collected from the surface of these sites. From Sarai-Rajai, besides microliths, hammer-stones and quern fragments alongwith a few semi-fossilized bones were collected. It appears to be a habitational site of the mesolithic people.

Grey ware and N.B.P. sherds were collected from Joorapatti and Gothua in the same sub-division of the district.

80. Excavation at Khairadih, District Ballia.— In continuation of the previous work (1982-83, pp. 92-94) the Banaras Hindu University under K.K. Sinha and Birendra Pratap Singh assisted by Ashok Misra, Ajaya Srivastava, S.C.S. Rana and Ajeet Kumar, research scholars of the department, resumed excavation in the same area (KDH-3).

Period I was marked by the same kind of pottery as has been reported earlier. Some new types in bowls and basins in black-and-red and black slipped wares were noticed viz., deep bowl with slightly everted featureless rim having long sides, bowl cum basin with splayed out rim in the former ware and bowl with rounded bottom in the latter. Besides, fragments of channel, spouted bowls of varying length and width in the black-and-red ware have also been found.

Amongst the painted motifs met within the black-and-red and black slipped wares, particular mention may be made of group of oblique and vertical strokes commonly seen in the former and the use of solid dots in the latter. A red ware sherd painted in cream colour with a group of multiple vertical strokes was noteworthy.

The cultural equipment remained unchanged but for the fact that four post-holes varying in diameter from 2-4 cms and fragmentary remains of a mud wall occurred in the earliest level of the period. The available height and the width of the mud structure respectively was 1.06 m and 0.62 m. Since the work was confined to a limited area no exact plan either of the post-holes or the mud structure could be ascertained.

Most significant discovery of the succeeding Period II, was an ironsmith's workshop. This was located on the northern end of the township and belonged to the uppermost phase of the period. The workshop consisted of a series of furnaces built in close proximity to each other. Only one of these was recovered in a somewhat better state of preservation. This consisted of a trough like structure built of terracotta. Its complete size could not be ascertained. Underneath this, was a funnel shaped structure. A gap of 2 cm width intervened between the two structures. This appears to have been provided to allow the waste product to flow out and get deposited in the vicinity in the form of slags. A huge quantity of slags weighing approximately 25 km was found strewn in the area. In the immediate vicinity of this workshop were also found finished tools of iron. Nor far from the ironsmith's workshop was recovered a part of a large sized trough which contained lot of ashy material and a few pieces of glassy slags. On the basis of the above findings, it can be assumed that the northernmost part of the township was earmarked for workshops.

The excavation brought to light a mud brick wall exposed up to a height of 2.10 m. Its exact plan could not be traced.

A carnelian pendant in the shape of a monkey, a terracotta sealing with the legend *Hathadevasa mitasa* in the script of second century BC, terracotta naga figurine copper coins, etc. were the noteworthy finds of the period.

In the course of the excavation in the previous season, blocking of a passage measuring

1.40 m was noticed on the southern side of the main road (Pl. 63). Considering its width it was thought to be a lane which branched off at this point from the main road on the southern side. Accordingly trenches were laid in this direction on grid pattern and as expected, it turned out to be a long lane. This lane oriented towards north-south was exposed up to a length of 30.60 m. Its width was not uniform as it measured 1.40 m, and 1.08 m and 8.64 m at different points. It was noticed that when the lane fell into disuse several walls were erected on the lane itself. Six such walls in the form of obstacles were noted at different intervals. The houses standing on both sides of this lane represented three phases of constructions. No plan of any house could be obtained as the main objective was to expose the length of the lane.

Resumption of work on the northern side to the extreme west of the previously excavated area brought to light fragmentary remains of several house complexes. Of these, particular mention may be made of a complex, which "consisted of at least two rooms and extending further on the western direction. The two rooms measured 2.83 x 2.34 m and 2.19 x 1.40 m. One of the rooms was paved with bricks. Further the house was approached from the northern side as suggested by the door-sills.

Small finds of the period comprise of copper coins, terracotta human figurines in Kushan styles (Pl. 64), beads of different materials, etc. Here special mention may be made of a circular wall-hanging made of soft stone and lavishly decorated on one side (Pl. 65). An attempt to decorate the other side of the specimen was also made but left incomplete. Another noteworthy find was a terracotta sealing without any legend but four different symbols of *dhvajas* within a railing are represented viz. Chakra *dhvaja,* mayura *dhvaja,* trishula *dhvaja* and hala *dhvaja.*

81. Exploration in District Basti.— The Department of Ancient History, Archaeology and Culture, Gorakhpur University, under Krishnanand Tripathi, conducted exploration and discovered two sites viz. Susipar and Barhagon in the Sadar tehsil of Basti. The sites yielded cord-impressed pottery, black-and-red ware, black-slipped ware, grey ware and red ware along with microliths such as cores, flakes, flake fragments and debitage of chalcedony, quartz, crystal and chert.

82. Exploration in District Chamoli.— The department of Ancient Indian History, Culture and Archaeology, Garhwal University, under K.P. Nautiyal, discovered a rock shelter which is situated on the right-bank of Alaknanda, about 8 km north-west of Chamoli, at an altitude of 2000 m above MSL. The preliminary exploration of the rock-shelter revealed several pre-historic paintings on the western face of the rock. The rock shelter was about 10 m high and the paintings were drawn on huge flat rock (4 x 6 m) overlooking a deep valley towards the north-east. These paintings, depicted groups of animals and human figurines drawn mainly in stick-like designs. The portrayal of legs indicated movements.

The paintings were done in deep-red ochre. Two human figures, comparatively big in size, flank the groups of animals and human beings. The animals depicted included stag and fox with long necks and snouts.

The discovery of pre-historic rock paintings was significant as it was the first evidence of its kind in this remote Himalayan region of Garhwal.

83. Exploration in District Etawah.— In the course of village to village survey, Suresh Singh of the Survey discovered sites yielding black slipped and medieval red wares at Jaunra and medieval red ware at Shabbadian.

84. Exploration in District Ghazipur.— Indu Prakash of the Mid-eastern Circle of the Survey, during the course of his exploration, discovered black ware and red ware of late medieval period in villages Baruin and Baghari; a mound yielding sherds of black and red ware, black slipped ware, N.B.P. and red ware in abundance which also includes handmade storage jars, vases, spouted vessels, bowls, dish-on-stand, three-legged perforated terracotta objects dateable to early or pre-N.B.P. period at Dharhni; red ware of late Medieval period at Khargas and Bazar; beautiful medieval sculpture of the Goddess Laxmi in grey sandstone standing in a very graceful posture, holding lotus and a *purnaghata* in her hands, flanked by various devotees, elephants, etc. and a brick temple were also found near by in village Lahuwar; and a mound yielding sherds of red and black wares at Tajpur.

85. Excavation at Hulaskhera, District Lucknow.— Rakesh Tiwari, Rakesh Kumar and Amar Singh, under the general direction of R.C. Singh of the Department of Archaeology, Government of Uttar Pradesh, resumed excavation in continuation of the previous work (1982-83 pp. 98-99) at Hulaskhera. The main objectives were to expose the remains of the eastern fortification wall and correlate it with other structural phases and reexamination of the cultural sequence. Eastern end of the fortification wall was completely exposed with the exit gate. Except the double entry system the architecture of the exit gate was very much similar to that of main entry gate. It was built of complete bricks and brick-bats of the different periods. In the other trenches Gupta and Kushana structural phases were exposed. The entire Kushana complex built of kiln-burnt bricks and mud mortar measured 36 x 22 x 5 cms. A well-planned drainage system was exposed in the trench Bl. A big storage jar was found *in situ* in one of the rooms resting on a floor belonging to the Kushana period. The jar was placed in a specially constructed circular structure of bricks (Pl. 66). A little amount of burnt grain was collected from the storage jar. (Pl. 67). It appears to be a convention of Kushana houses to have such circular structures in the rooms, several hearths in different shapes and a kiln inside and outside the house complex. The Kushana road which was previously exposed was further excavated up to 200 metres in length.

The ceramic industry of different periods comprised of wheel-turned red ware ranging from medium to coarse fabric. The types included storage jars, short and high necked water vessels, basins, footed bowls with inturned rims, spouted water vessels, small and big sprinklers, dishes, inkpots, button knobbed, and cylindrical knobbed lids. Besides, noteworthy antiquities included a number of Kushana coins and Gupta terracottas from the different trenches. Some of the sealings were important for their legends of which one bears the name of 'Rudra'

and the other 'Gargeshwar'. Eight sealings of the Gupta period were recovered bearing the legend *'Maharaja Kashikauputrasy a Gaza'.* One gold bead and some gold coated glass beads were also found from the site. A kushana terracotta figurine found from the site was notable for bulging eyes, open mouth, prominent moustaches having a beard punched on its face.

86. Exploration at Naujheel, District Mathura.— R.C. Gaur of the Aligarh Muslim Univer sity, collected sherds and its associated ware from Naujheel, which is situated on the right-bank of the Yamuna.

87. Explorations in Dudhi, District Mirzapur.— In continuation of the earlier work, the Department of Archaeology, Government of Uttar Pradesh, undertook exploration in Dudhi region which was conducted by Amar Singh, Ambika Singh and Raj Kumar under the direction of R.C. Singh. They discovered a number of Mesolithic, Neolithic and Medieval sites.

Mesolithic tools were collected from these sites — Shiva Pahari, Kharkahunwan, Kau-vakhoh, Jhura Ahara, Kathwa Pahar, Teri Shekhuwa, Samsehrawa, Bawanjharia, Bhelhwakhari/ Kathwa, Padera, Kurwa, Tenwaleva, Sindurteeka, Pahar, Koreywa, Surangahi, Kuruluwa Khoh in Wyndhamganj area and Lakara Bandh, Baraidand, Beedar, Lambari Pahar, Gijanahwa Pahar, Rajkhand Bandh, Nimiyadeeh, Tera Pahar, Daldaliya Pahar, Dainiya Pahar, Domardeeha, Dum-han Pahar, Harha Pahari in Dudhi area. Polished stone celts were also picked up from Shiva Pahari. Apart from this, fragments of medieval sculptures and remains of temples were also reported from Shiv Pahari.

88. Exploration in District Pithoragarh.— During the course of the village to village Survey, the Department of Archaeology, Government of Uttar Pradesh, Hemraj undertook exploration work in Champawat tehsil of Pithoragarh district. The town of Champawat remained a capital city of the rulers of Chand Dynasty after the downfall of the Katyuris in Kumaon. Moreover, the hilly track along the river of Kali in Pithoragarh district falls on the way to Mansarovar and Kailash, the holy places of the Hindus from ancient times.

The exploration of villages in the vicinity of Champawati revealed ancient monuments, sites and other archaeological objects. Ancient temples with various sculptures ranging in date from early to the late medieval period were discovered at Chaikuni, Chauki, Dhone, Goral-chod, Joop, Kannalgaon, Kubland, Madli, Phungar and Setdyuda villages. The Shiva temples at Chaikuni and Talli madli had Devnagari inscriptions dated to the Saka-Era 1296 (AD 1374) and Saka 1332 (AD 1410) respectively. All the temples were built in Nagara style; *triratha* on plan with a sanctum, *antarala* and a pillared portico. The Jangha portion of the temples of Chaikuni and Setdyuda were profusely decorated on the exterior.

The sculptures of Surya, Uma Maheshwar, Vishnu, Ganesh, Mahisasura mardini and a broken door jamb bearing images of doorkeeper, female figurines carrying water vessels and lakulisa dateable to c. eighth-ninth century AD were discovered in a modern temple locally known as Ghataku near the village of Chauki. An image of Ganesha in grey sandstone belonging to ninth

century AD was found in a modern temple at Dipteshwar, situated on the left-bank of the River Gandaki. A sculpture of an headless Vishnu assignable to *c.* twelfth century AD was found lying in an old temple at Agera near Setdyuda village. Three images of Vishnu and a broken *sapta-matrika* slab belonging to twelfth-thirteenth century AD were found lying uncovered at Jhali-Mali outside the village Phungar.

Covered water reservoires alike temples, locally known as 'Naula', were discovered near the villages of Bhairawan, Chakku (Devi-ka-Naula). Dhakana (Ek-Hathia Naula) and Dun-gra-Sethi (Nag-Naula). Two Devnagari inscriptions dateable to fourteenth century AD were found at Nag-Naula and Devi-ka-Naula. Naula was a small tank built on bubbling waterspring with many offsets, surrounded by four walls and covered with a domical roof. There was a pillared portico in front of its gate. The inside walls and ceilings were richly decorated.

Old graves about 25 in number were located at a place locally known as 'Jogiani Gore' outside the village Phungar, situated on the Champawat-Tamili road. They were constructed out of massive stone slabs and were circular on plan.

89. Exploration in District Pratapgarh.— Indu Prakash of the mid-eastern Circle of the Survey discovered a number of brick structures belonging to the medieval period and also grey sandstone sculptures of Uma Maheshwara and standing Vishnu in village Ajagara.

90. Excavation at Damdama (Warikalan), District Pratapgarh.— The excavation was resumed by the Department of Ancient History, Culture and Archaeology, Allahabad Univer sity, at Damdama (Warikalan), a Mesolithic burial-cum-habitation site in Patti subdivision of Pratapgarh district. The participants were R.K. Varma, V.D. Misra, J.N. Pandey, J.N. Pal and members of the technical staff. In this season nine graves were exposed *in toto.* In one of the trenches in the lowest level, one grave was located but due to the shortage of time it could not be fully exposed.

The graves, wherever the complete outline was available, were oblong on plan. In all the cases, without any exception, these were shallow graves. With one exception, the skeleton remains of single individual were obtained from the graves suggesting thereby that the graves were prepared for one individual alone. However, in one grave two individuals, one male and one female, were found buried. The width of the grave and the placing of human bones clearly indicated that this grave was prepared for two individuals.

Of the skeletons exposed this year, seven were oriented in west-east direction with the skull lying to the west while one skeleton was east-west oriented. However, in two cases, i.e. double burial, north-south and south-north orientations were observed. (Pl. .68).

In as many as seven cases the sex of the skeletons could be determined. Of these, four were presumably male while the remaining three presumably female.

All the skeletons exposed so far at the site belong to adults. No skeletal remains of child or old person was obtained.

In one of the graves (grave VII) burial goods were also found. Two arrowheads and one pendant made of bone were obtained. These objects were found kept to the left of the

left-tibia. It is not unlikely that the grave in question contained the skeletal remains of a significant member of the community.

Evidence of palaeopathology was also available in some cases. Evidence of *carcass* was discernible in a few skeletons. The left humerus of the skeleton buried in grave VII showed deformity in the shaft.

The skeleton exposed at Damdama (Warikalan) compared well with their counterparts at Sarai-Nahar-Rai and Mahadaha excavated earlier. like the skeletons in these two sites the skeletons of Damdama brought to light evidence pertaining to the existence of a human group once occupying this part of the Ganga valley who were well-built, sturdy, and dolicocephalic.

All the skeletons were highly calcified and had acquired chocolate colour. The weight of bones suggested that they were in an advanced stage of fossilization.

The occurrence of pit-hearths was a characteristic feature of the site. These hearths were characterized by burnt clay lumps, charred animal bones and ashy soil. The hearths could be divided into two categories, (i) plastered and (ii) unplastered. The former included such hearths in which the side and bottom of the hearth were found plastered. The occurrence of charred and semi-charred animal bones in some of the hearths clearly suggested that these were used for roasting animal flesh.

With a view to determining the stratigraphy of the site, deep diggings were conducted in a few trenches in all the sectors — western (squares H-6, H-7,I-6,I-7, J-6, J-7), central (squares J-l, J-2, M-8, M-9) and eastern (squares A-23, A-24), which brought to light a habi-tational deposit having a thickness of about 1.5 m divisible into ten layers. With the exception of layer 1, all the layers yielded almost identical material and could be ascribed to the Mesolithic phase. The available evidence suggested that the first occupants of the site settled on top of the natural soil in which their graves and hearths were dug. From the layers associated with Mesolithic deposits, microliths, charred, uncharred and semi-charred animal bones, bone objects, burnt clay lumps, querns and mullers were obtained.

With a view to determining the nature and character of the mesolithic economy, soil samples were sieved by the flotation technique. Some seeds (millet-like) were obtained.

A fairly large number of microliths comprising finished tools, used flakes, cores and debris were found from both, the surface and the excavations. The microliths obtained from the site could be divided into two broad categories, (1) unmodified waste, (2) finished tools and utilized artifacts. The first category included unretouched and utilized artifacts. The unmodified waste has been grouped into blades, blade fragments, flakes, flake fragments, cores, core timing flakes, and core rejuvenating flakes.

Among the finished and utilized artifacts mention may be made of blades, normal re-touched blades, normal and inverse retouched blades, *ouchtata* retouched blades, straight backed blades, convex backed blades, partly backed and retouched blades, double backed blades, backed and truncated blades, triangles, trapeze, lunates, percoid, drill and scrapers. A few micro-burins also have been obtained. The artifacts were made on chalcedony, chert,

quartz, agate and carnelian. As the raw material was not locally available, the Mesolithic hunters and gatherers were forced to exercise utmost economy, which is evident not only in the size of the tools but also in the size of cores.

Of the bone objects found at the site, mention may be made of arrowhead and pendants. These objects were fashioned on split bone antler or horn core. Antler was preferred for making arrowheads. Among other bone objects mention may be made of bangles and beads (unfinished).

The stone objects found at the site included quern, mullers, anvils, hammer stone, etc. Occurrence of these objects gave some indication about the character of economy of the people. As these objects might have been used for processing mainly vegetal food it is not unlikely that with hunting, gathering also played an important role in their economy.

The excavations at the site brought to light a large number of animal bones belonging to cattle, sheep/goat, ass, deer, stag, tortoise, fish, birds, in charred, semi-charred or unchar-red condition. The availability of these bones at the site in such a large number furnished evidence not only about the hunting economy of the people but also about the range of animals roaming in the area at that time. Besides, the assemblage also gave some indication about the prevailing climatic conditions during the Mesolithic times in this part of the Ganga Valley. It is interesting to observe that like the human bones mentioned earlier the animal bones obtained at the site were also highly fossilized and they too had acquired a chocolate colour.

WEST BENGAL

91. Excation at Dihar, District Bankura.— Anil Chandra Pal of the Department of Archaeology, University of Calcutta, conducted an archaeological excavation at Dihar, in the Bankura district. He was assisted by Samir Kumar Mukherjee, B.C. Chatterjee, N.C. Das and P. Ghosh. Bihar is situated on the bank of the River Darakeswar and is roughly 6 kms. away from the town of Vishnupur in Bankura. The horizontal trench was laid on the eastern side of teh 'Kana Nadi', the dried bed of the River Darakeswar with a view to obtaining a complete sequence of the site. This season's excavation was confined to two trenches (A-8 and A-10). The digging reached down to the earliest chalcolithic period at an average depth of 2 m below the surface level. Deep digging was restricted to a limited area in trench A-10 down to the natural soil at the depth of 3 m below the surface level.

The excavation revealed for the first time in this district the nature and character of the chalcolithic culture. This extensive site 99668 SMT rising some 7 m from the river bed had a cultural deposit of only 2 m at its maximum. The excavation revealed two distinct cultural periods without any break, viz. the Chalcolithic period (Period I) and Early Historical period (Period II).

The evidence of structural remains was obtained in both the periods. The floors of Period I were of beaten earth with soiling of rammed terracotta nodules and lime.The presence of re-impressed clay daubs, burnt reed-impressed clay plasters and large quantities of char-

coal indicated that the houses of the Chalcolithic people were of simple construction.

The ceramics of Period I included black and red ware, pale red ware, grey ware, black slipped ware and buff ware. Black painted ware appeared to be very rare at this level. Typical black and red ware consisted of the carinated bowl with splayed out or flaring rim and convex sided bowl with a sagger base. An interesting discovery was the large quantity of antler tools and bone implements occasionally found scattered all over the floor level of this period. The tools included picks, chisels with broad and narrow end, scrapers, needle and drill. This period further yielded microliths comprising blades, scrapers of different forms and paints together with microcores. Knowledge of cultivation was evidenced by the finds of neolithic tools found from the surface level. Fagments of copper and copper antimony rods were also found. The material remains of period I were found confined from layers 5 to 7.

The succeeding period II, early historical in character, witnessed the introducation of iron and was marked by usual ceramics of the early Christian era, i.e., Sunga and Kushana bowl, a large number of cast copper coins (Pl. 69) stone beads, terracotta objects, etc. No evidence of N.B.P. was found in this period. Occupational deposits of this period extended from layers 1 to 4.

92. Exploration in District Malda .— A.Jha of the Eastern Circle of the Survey in course of his exploration noticed a mound with remains of a brick structure of the medieval period at Bagbari, a brick temple on stone plinth of the fourteenth-fifteenth AD at Chandipur and the ruins of a medieval stone temple on a mound at Bachamari.

93. Exploration in Akuldaba, District Midnapur.— The site is situated about 6 km to the north-east of Kattara was explored by S. De and B. Samant of Directorate of Archaeology, Government of West Bengal. In course of exploration, thirty-five copper objects akin to the copper hoard culture were collected.. These objects were accidently found by the villagers during routine digging. The department also noticed a cave on the top of the hillock known as. Godasini which is lying in the north-east corner of the village Akuldaba.

94. Exploration in Chirakuti, District Midnapur.— In the course of exploration, S. De and B. Samant of the Directorate of Archaeology, Government of West Bengal, collected one unique highly pattinated cordiform point made on flake, the butt portion of which was thicker than the cutting edge.

95. Exploration in Dhuliapur, District Midnapur.— S. De and B. Samant of the Directorate of Archaeology, Government of West Bengal, surveyed an elevated tract of village Dhuliapur flanked by Tarafeni situated 6 km to the north-west of Belgahadi. Artifacts obtained from the site included mirolithic tools like borers, scrapers and flakes, neolithic celts, slingstones and sherds of red ware. The red ware sherd with single perforation at the bottom is noteworthy.

96. Exploration in Kankrajhor, District Midnapur.— During their course of exploration, S. De and B. Samant of the Directorate of Archaeology, Government of West Bengal, noticed a Stone Age site in village Kankrajhor flanked by Kharsoti, a tributary, of the River Subarnrekha. From an elevated tract on the western bank of this stream were collected a few microlithic tools, fragmentary neolithic celts, two broken ring-stones and neolithic pottery.

97. Exploration in Kattara, District Midnapur.— The place explored by S. De and B. Samanta of the Directorate of Archaeology, Government of West Bengal lies 6 km to the north-west of Belgahadi in the District Midnapur. A nullah flows past this place. The lithic tools collected from the western flank of this nullah ascertain the various stages of the development of the Stone Age culture. Particular mention may be made of tools like paints including one of cordiform type, blades and tank arrowheads of the upper Palaeolithic time, microlithic tools, cores and flakes of the late Stone Age. From the slope of a rocky terrain in the eastern flank, tools like paints, knives, scrappers, hollow scrapers, gravers and borers belonging to the upper Palaeolithic times and some broken neolithic shells and ringstones were collected.

The site is situated amidst a valley lying between two hills and deposits found here were partly rolled materials fallen from the hills and partly filled by the nullah, which is a tributary of the Tarabani. There is evidence of land erosion probably due to seasonal rain.

98. Excavation at Ballal **Dhipi, District Nadia.—** In continuation of the previous year's work the Eastern Circle of the Survey, under N.C. Ghosh, assisted by Bimal Bandyopadhyay, A.K. Bandyopadhyay, G.N. Srivastava, T.J. Chakravarty, S.K. Ghosh, S.K. Kundu, A.B. Sen, K. Srimani, P.C. Das and C. Khamaru resumed excavation at Ballal Dhipi with a view to exposing the main structure and to ascertain the cultural sequence of the site.

This season's work was mainly centered round the northern and western sides of the mound. It was observed that the exposed structure which was believed earlier to represent a religious edifice was in all likelihood a *pancharatha* temple located within a walled enclosure. It consisted of an outer wall in *pancharatha* style, the width of which was 1.90 m, built of brick, the size of which varied between 20 x 16 x 4 cm and 24 x 19 x 5 cm, the common size being 20 x 16 x 4 cm. The arms of the projections which were relieved with off-sets were having a length of 5.50 m north-south and 3.15 m east-west, the central projection being 14 m long. This stupendous structure 7 m long from the foundation laid on a brick platform which was also 1 m high from the ground as evidenced in the south-western corner (Pl. 70). The intervening space between the outer wall of the structure and the inner wall was 1.76 m in width, filled in with earth and at the present stage no occupational level was identified in it below the rammed lime floor which was encountered at a depth of about 1.50 m from surface. The interior of the structure was also in coherence with its counterpart and similarly *pancharatha* on plan. The length of its projected arms were 5.50 m north-south and 3.15 m east-west respectively. The central projection was 9.40 m long. The character of this massive structure, which in its exposed parts represented a cruciform plan inside a bigger cross was ambiguous as the projected walls did not have a superstructure over them. It was further to be noted that the

use of the intermediate space between the inner and the outer parts of the structure which apparently served the purpose of circumambulation was not clear. As yet no working level was found to prove its use, the structure had undergone renovations and repairs in its upper level. At least two floor levels were encountered. (Pl. 71). On the topmost level a brick edged pathway is made towards the last stage of occupation for circumambulation. On the lime *surkhi* floor in a trench a good number of copper objects were encountered (pl. 72). The upper part of the structure in its renovated portions revealed in corners five-fold projections, cornice formed by moulded bricks, the monotony of walls were broken by the provision of niches. It appeared that at a later stage the upper part of the structure was renovated as a shrine. There were traces of the lime plaster around. The discovery of a drainage with a gargoyle in stone with the shape of a crocodile face channeling off water in a circular *kunda,* which was possibly used for ablution was noteworthy (Pl. 73).

A number of copper objects found on the floor meant for probably some religious purpose. The objects included spouted *lotas,* lamps, ladle and a number of cylindrical cases, the use of which in all probability was for keeping valuable records.

Two heads in stucco found from the upper level were interesting. One of them was having a deep depression on the forehead indicative of a third eye. A female head in stone was also noteworthy (Pl. 74). The most remarkable find, however, was a male figure in basalt which exhibited characteristic features of *a gana* (Pl. 75). These objects were dateable between *c.* .tenth and twelfth centuries AD to which period the structural complex at Ballal Dhibi belonged.

INDO-FRENCH ARCHAEOLOGICAL EXPEDITION

The aim of this geoarchaeological expedition was to study the archaeological site in relation to their environmental setting, and particularly to study the ancient drainage system and to locate ancient artificial irrigation systems if any, especially during the protohistoric period when a supply of water was required to grow winter crops. The area investigated was situated along a portion of the Chautang palaeo-channel and in neighbouring regions (district of Hissar, Bhiwani, Rohtak, Mahendragarh all in Haryana and of Churu, Jhunjhunu, Ganga-nagar all in Rajasthan). The Indo-French team consisted of (alphabetical order), R.S. Bisht, M.A. Courty, H.P. Francfort, P. Gentelle, K.P. Gupta, V. Roux and A.K. Sharma. J.R. Batra, A.K. Sinha, Puran Singh and Shivnath Singh also assisted the expedition. The work was devoted to a general overview of the area, including a visit to the already well-known sites like Kalibangan, Banawali, Siswal, Mitathal, Agroha, Ganeshwar, Jodhpura, Didwana, Paoli and Rakhigarhi.

In 1983, investigations were carried out in the Kantli and Dohan Valley. The Dohan and the Kantli originated in the Aravali Hills near Nim-ka-Thana to flow respectively in north-north-eastern and north-north-western directions through a rugged landscape formed of the stablished sanddunes which might have been under the cover of the semi-desertic forest. The thick mantle of water starved sandy soil over the entire catchment area and the poor rainfall

which might have not been appreciably higher over the last five thousand years fairly demonstrated that those were not perennial rivers playing any significant role. The archaeological finds collected from certain areas in either system are definitive pointers towards the poor presence of viable settlement patterns during the protohistoric times. R.C. Agrawala located about 42 prehistoric sites in the Kantli. But the survey conducted by K.N. Dikshit as well as that by the present team demonstrates, on the present showing, that the lower reaches' of the Kantli beyond Sonari Ghat and Dohan are not teaming with the Copper age or Iron age or early historical settlements. As far as continuation of those rivers further northwards so as to meet a river of the Ghaggar system is concerned, it appears that its possibility is remote and bleak. The Kantli ends up in a group of depressions characterized by lacustrine sandy clay with numerous molluscs and shell remains; that these lacustrine deposits are earlier or contemporaneous to the protohistoric period is difficult to spell out; the present analysis of the collected samples of pollen, and shells will throw more light on this problem. Information was collected about the history of the dunes formation and evolution in relation to the river system and human settlements in this area. Sixty-nine wells and sections were examined and soil samples were taken for various analyses. The following points emerged in a preliminary attempt:

— the natural drainage system of the area dried up during early holocene.
— drier phases followed during which dunes were formed and the river palaeo-channel was progressively filled up by aeolian deposits and monsoon floodings.
— the major alluviation phase was over before the pre-Harappan period: sites n. 144, 197 for instance, are lying upon 8-10 m of deposits filling the palaeo-channel.
— no import alluviation occurred since this period except locally by monsoon floods in the Bhadra depressions.
— soils of different fertility were cultivated by the population of various periods from protohistoric times.

These local differences in fertility (and prosperity) are going to be studied in further detail in order to get new insight about possible explanation of the settlement pattern.

Three canal systems of three different periods were observed.

— One 19th century canal, the Bhadra branch of the western Yamuna was in use from 1825 to the beginning of the 20th century. Its traces were visible on the surface at various places. One section made near Bhadra showed that it was covered by sand in this part.
— The medieval canal (Firuz Shah Tughluk and Mughal) was divided into two branches, the Bhadra and the Darba branches. The Bhadra branch, going south-west was visible on surface in Haryana but no more traceable on surface in Rajasthan except at some points. The Darba branch going north-west was perfectly followed up to

Maharana (Haryana, district Sirsa); it is in the shape of a long dune (sometimes 30 m wide and 4 m high). A sub-branch going west from Gadli to Chaharwala has been cut; typical canal deposit is clearly present in the section.

— On site no. 175 near Bhadra, a section was noticed in a brick kiln dig. It was possible to refresh and deepen this section with a minimum of difficulties. The section showed three superimposed stages of a canal; the deepest of them was buried under 4.5 m of later Aeolian and monsoon flood deposits. Potsherds were collected in the course of working; the absolute date of these canals will be determined by thermo-luminescence and various means, but they seem definitely pre-medieval and could well be of protohistoric times. Further investigation on canal systems will have to be performed by tracing the networks and trenching the canal remains in some places.

Two hundred and nine sites belonging to various periods were visited. A preliminary look at the pottery collected allowed us to propose some broad classification sites:

Medieval sites: They ranged from 8th to 18th century and occurred in all the explored areas, including in the non-irrigable parts.

Historical sites: Some appeared in the northern part of the explored area, which was not very faraway from the Agroha mound; others were located in the Kantli and Dohan Valleys.

Protohistoric sites: They were found mostly to the north of the explored area but not in the Kantli and the Dohan Valleys or in the neighbouring sands. They included Pre-Harappan to Late Harappan and P.G.W. sites. Their distribution pattern showed that they were certainly located along the branches of irrigation canals as they were in lines not necessarily following the palaeo-channel of Chautang. Further examination of the collected material will further support these broad chronological divisions and connect more precisely the site distribution with the irrigation networks of the considered periods.

Fourteen villages were visited among one Malkhaira, tehsil Bhadra, and district Ganga-nagar, Rajasthan was selected for an in-depth enquiry. Data were collected about traditional agricultural practices on soils of various fertility in areas irrigated and not irrigated. Their data will be of the greatest value for the reconstruction of the economic system of the settled area in ancient times, especially to study the rural aspects of the protohistoric urban civilization.

Two types of analyses were carried out and are still in progress:

1. Microscopic observations of undisturbed samples through petrographic and scanning electron microscopes, were taken on the field and impregnated with synthetical resins; large thin sections were then made (13, 5, 5cm) and studied with microscopic tools. Detailed mineralo-gical data and particle size distribution were thus obtained. From these results origin and way of sedimentation (alluvial, Aeolian, anthropogenic) were reconstructed for the different types

of material studied. Observations of sand grain surface and phytolith shapes at a very high magnification with scanning brought very useful complementary information. Post-deposi-tional processes were also studied with microscopic tools.

2. Chemical and physico-chemical analysis were carried out by, X-ray process on the clay fraction in order to complete the microscopic data. PH, exchangeable capacity, calcium carbonate content and organic matter content were determined in order to compare fertility of ancient and present-day soil.



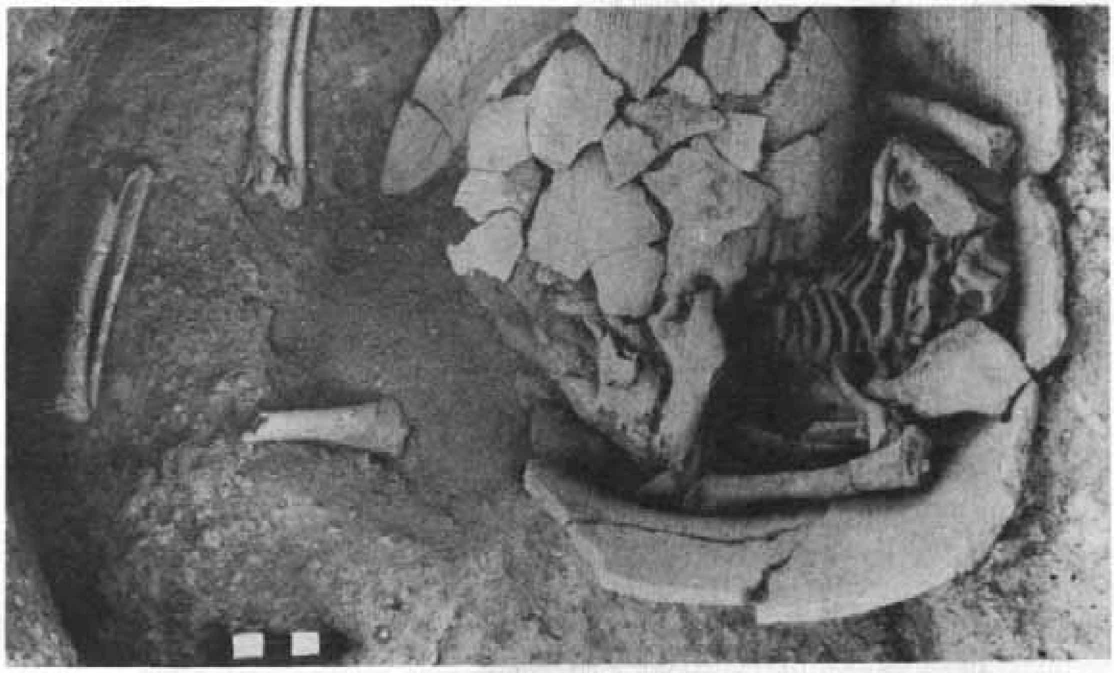
1 Vaddamanu: Stupa of the Post-Asokan Period on the summit. *See page 2*



2 Vaddamanu: Fragment of a railing Pillar with the representation of Mithuna (post-Asokan). *See page 3*



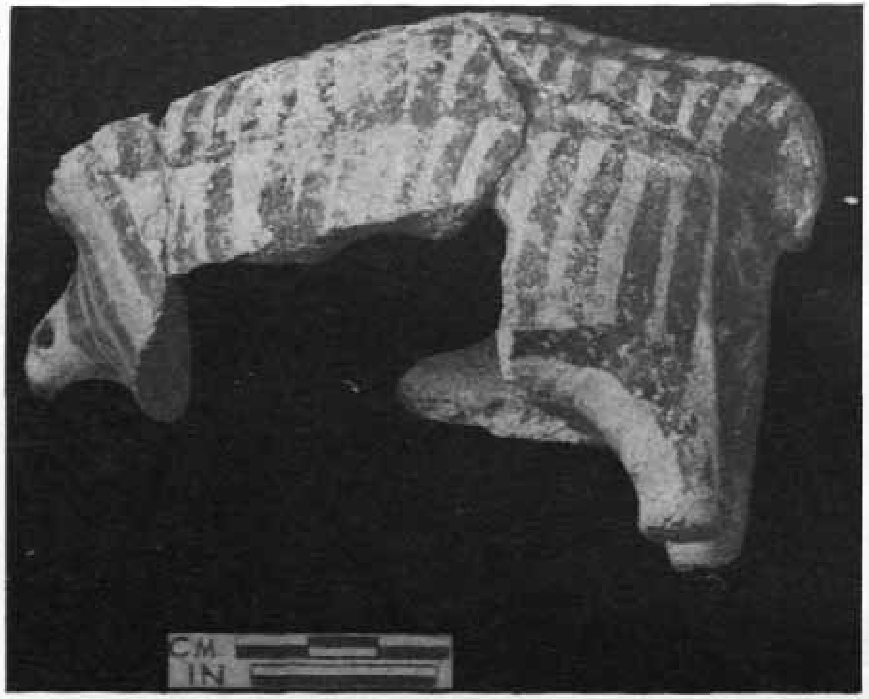
3 Vaddamanu: Fragment of railing Pillar Post-Asokan Period. *See page 3*



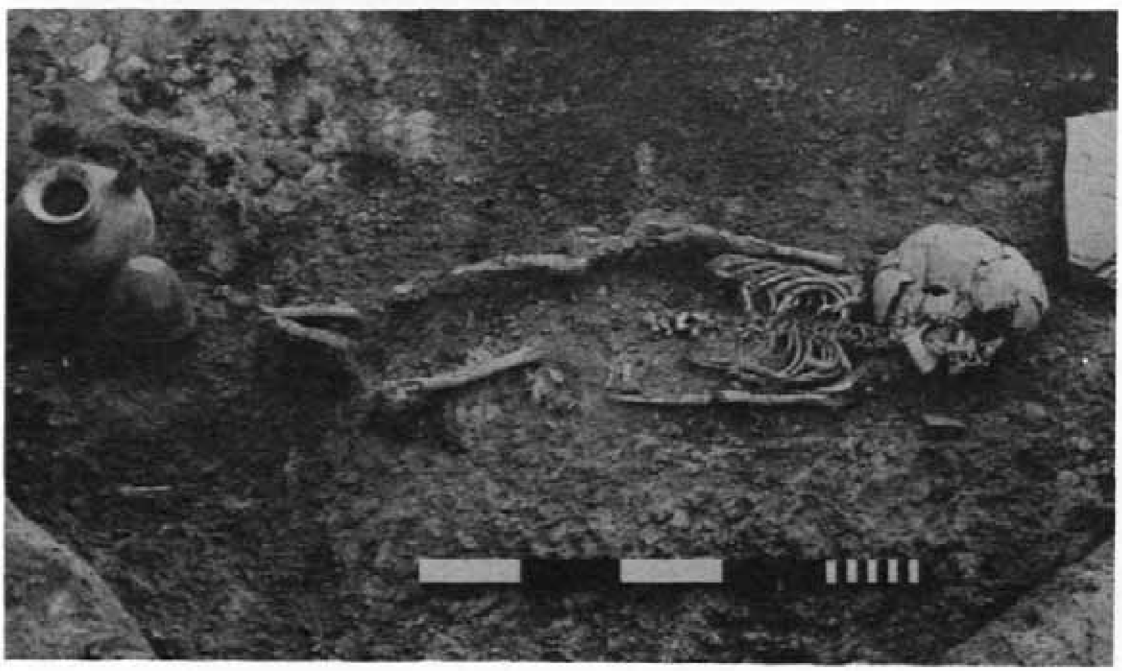
4 Ramapuram: Inverted urn burial of a child (Period 1 A). *See page 4*



5 Ramapuram: Shallow Pit burial of a child (Period 1 A). *See page 4*



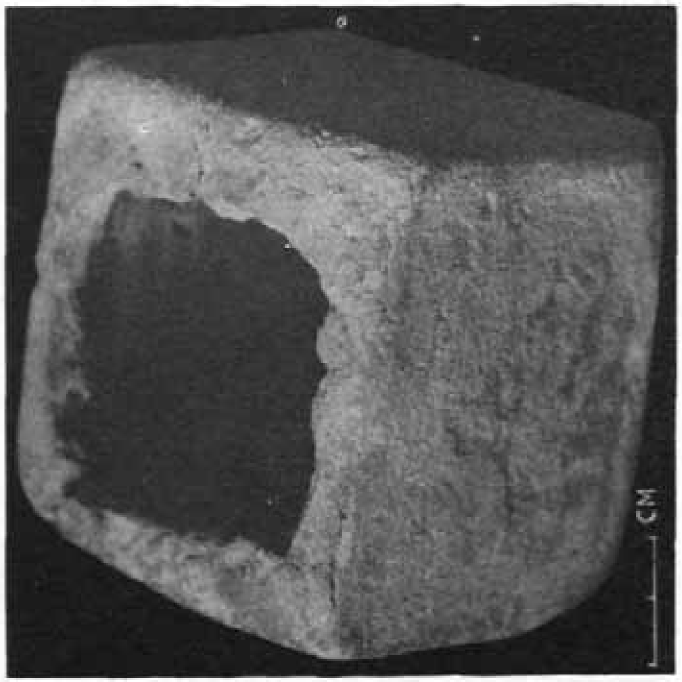
6 Ramapuram: Painted Pig, (Period 1 A). *See page 4.*



7 Ramapuram: Skeletal remains of a child, (Period 1 B). *See page 4*



8 Ramapuram: Long necked vase with spout, (Period 1 B). *See page 4*



9 Ramapuram: Squarish Pot, Period 1 B. *See page 4*



10 Ramapuram: A necklace of steatite beads, Period I B. *See page 4*



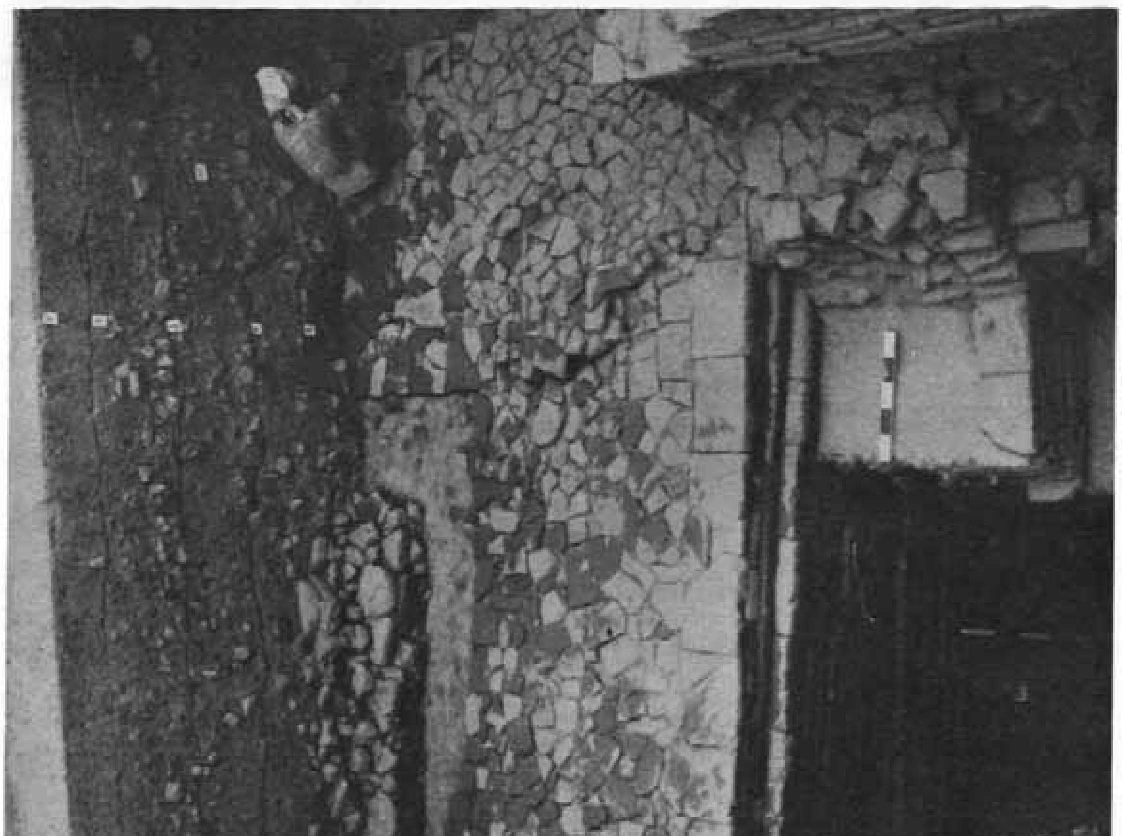
11 Taradih: Bone tools, Period I. *See page 12*



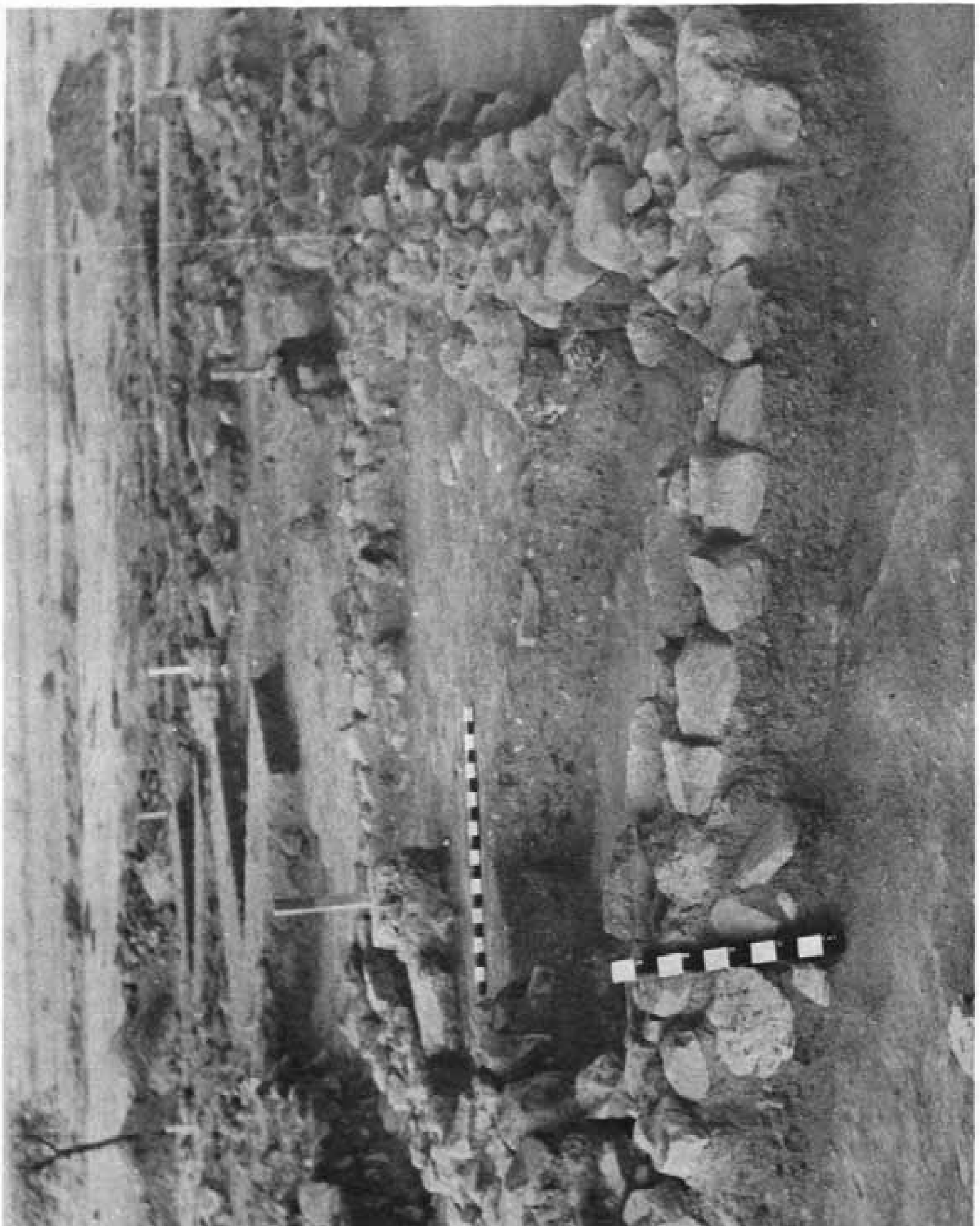
13 Taradih: Terracotta seal, Period V.
See page13



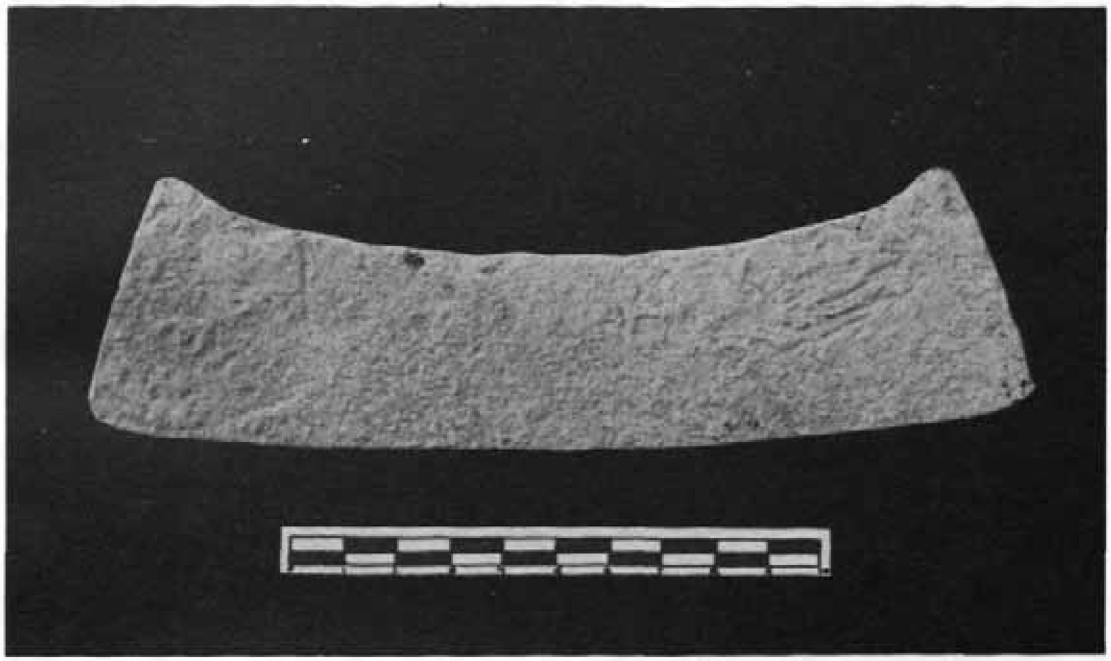
14 Taradih: Terracotta sealing, Period V.
See page 13



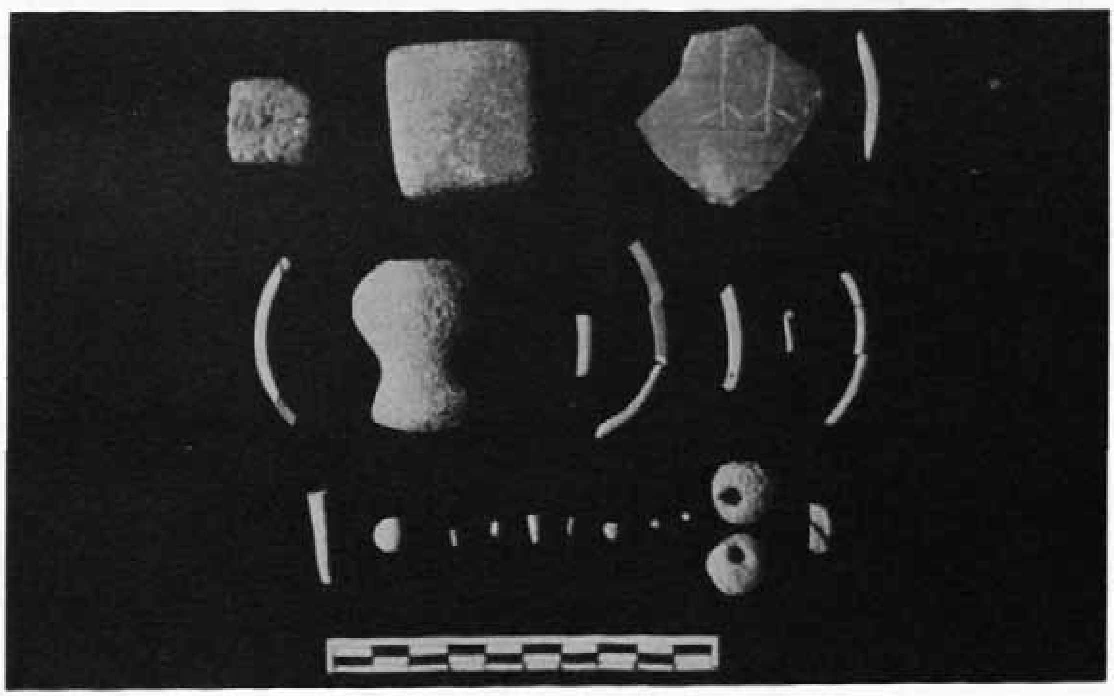
12 Taradih: Brick structures, Period V. *See page 13*



15 Rojdi: Structures of undressed stones set in mud plastar. *See page 19*



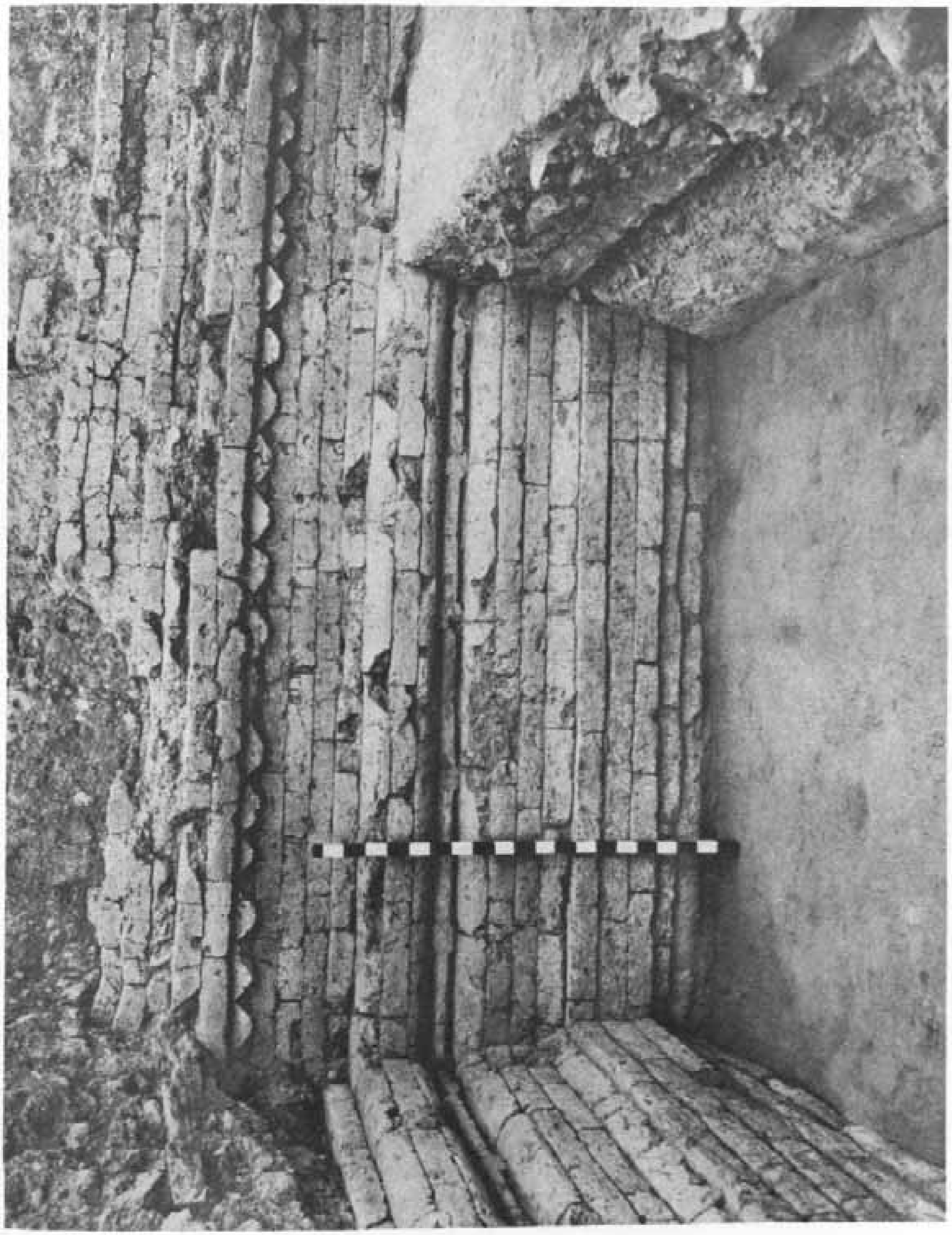
16 Rojdi: Knife bearing endless knob. *See page 23*



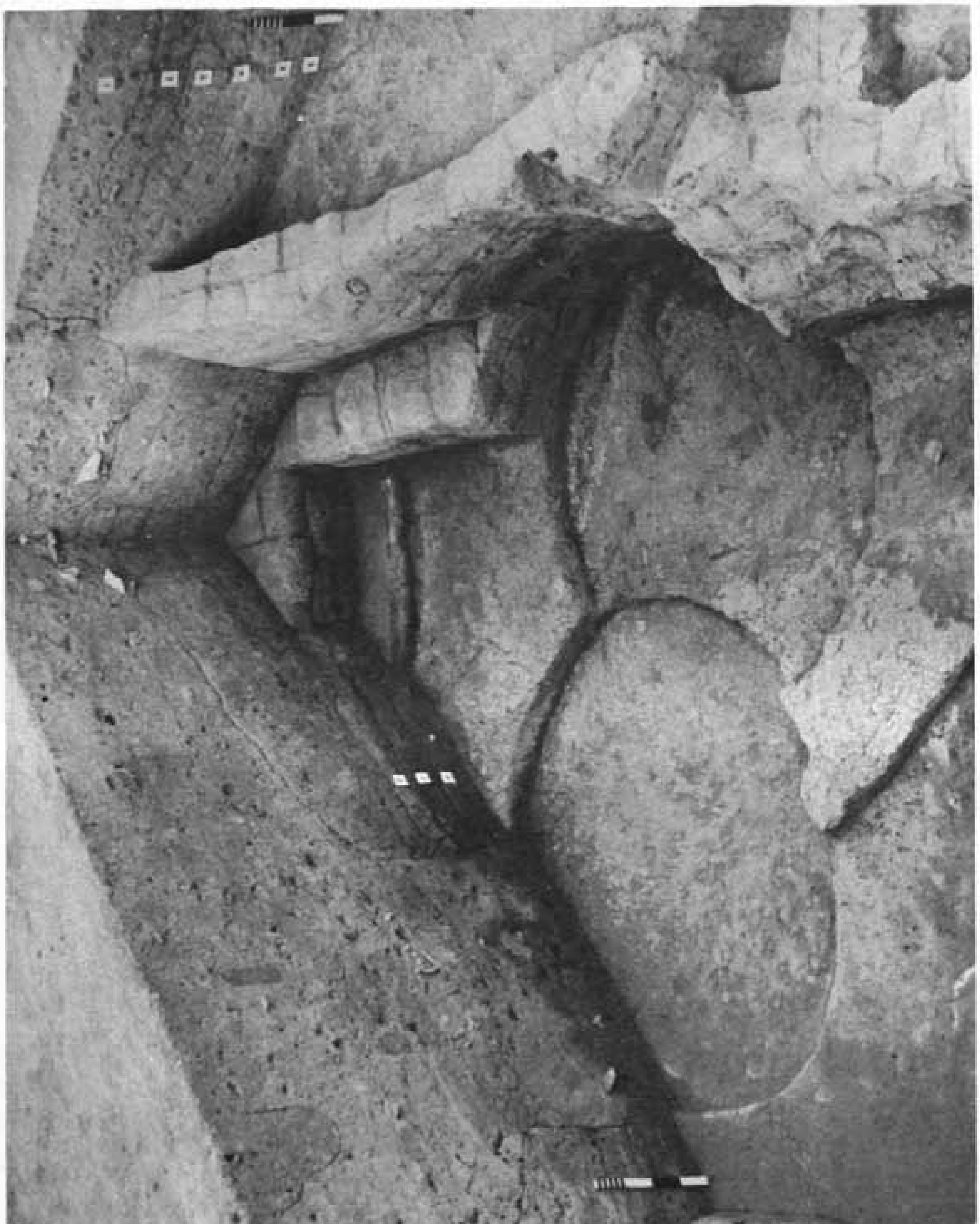
17. Rojdi: Beads of carnelian, steatite and other antiquities. *See page 23*



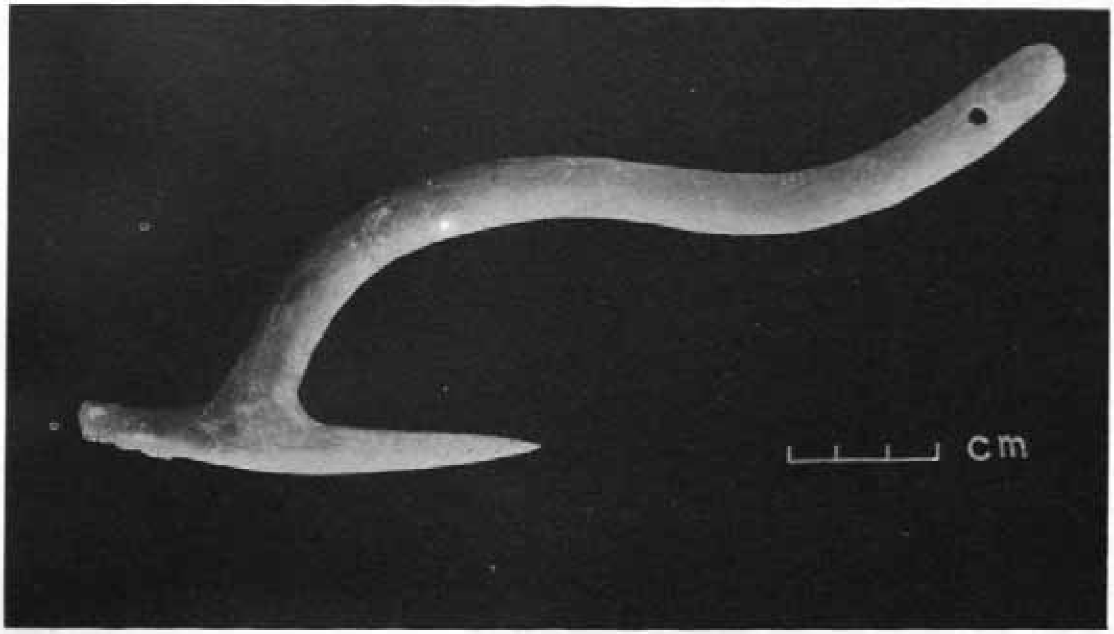
18 Goraj (Mahadeopura): Partly exposed brick structure with stone drains (*Pranalas*) and *Kunda*. See page 23



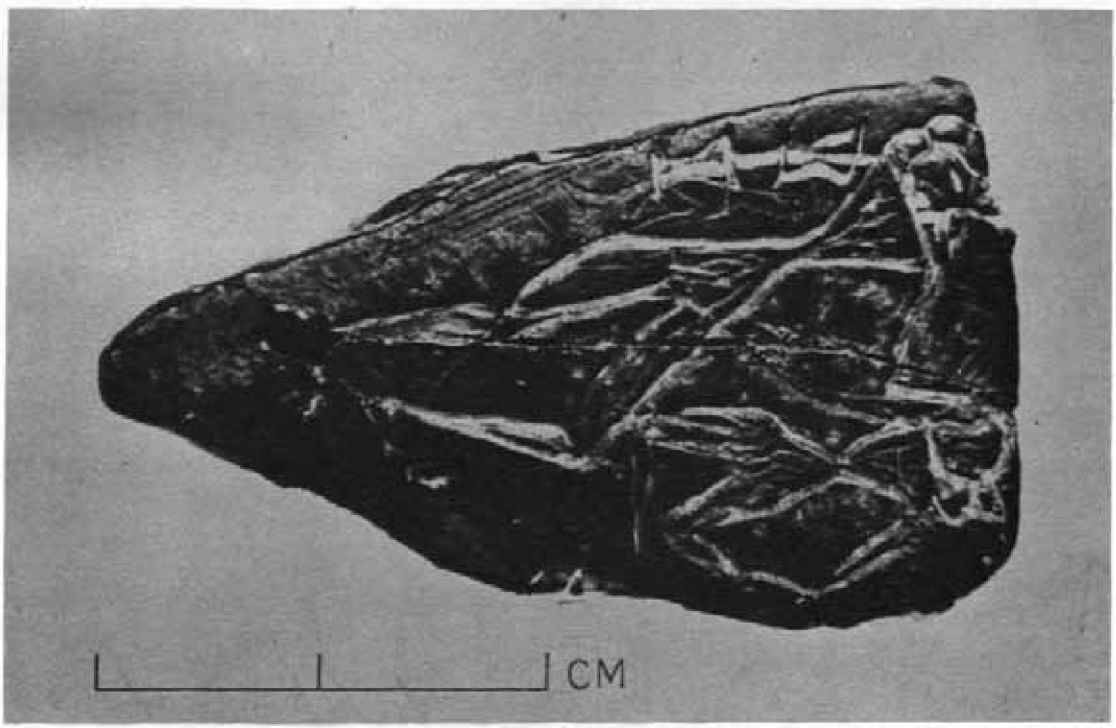
19 Goraj (Mahadeopura): Partly exposed brick structure. *See page 23*



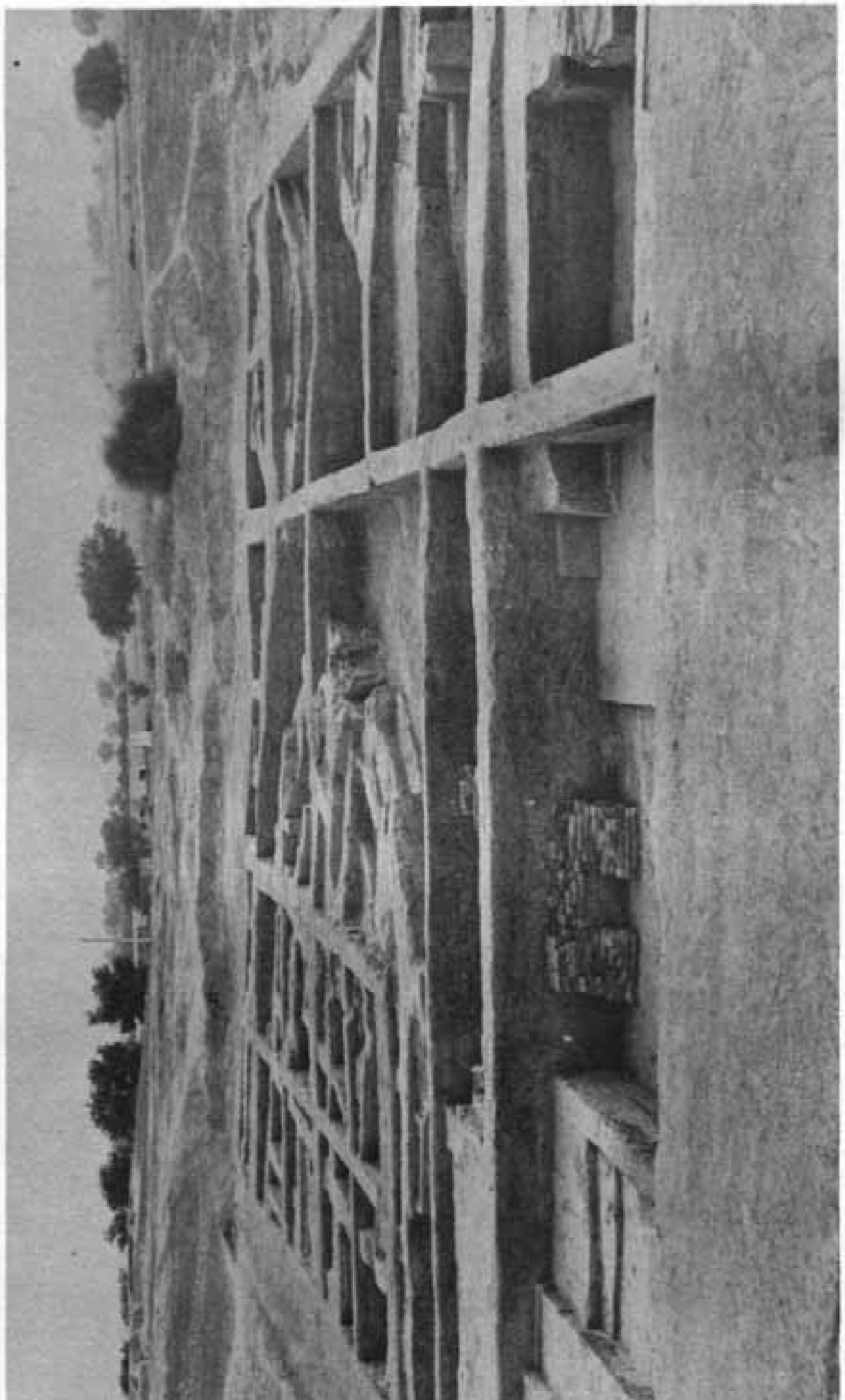
20 Banawali: Successive corn silos, Period I. *See page 24*



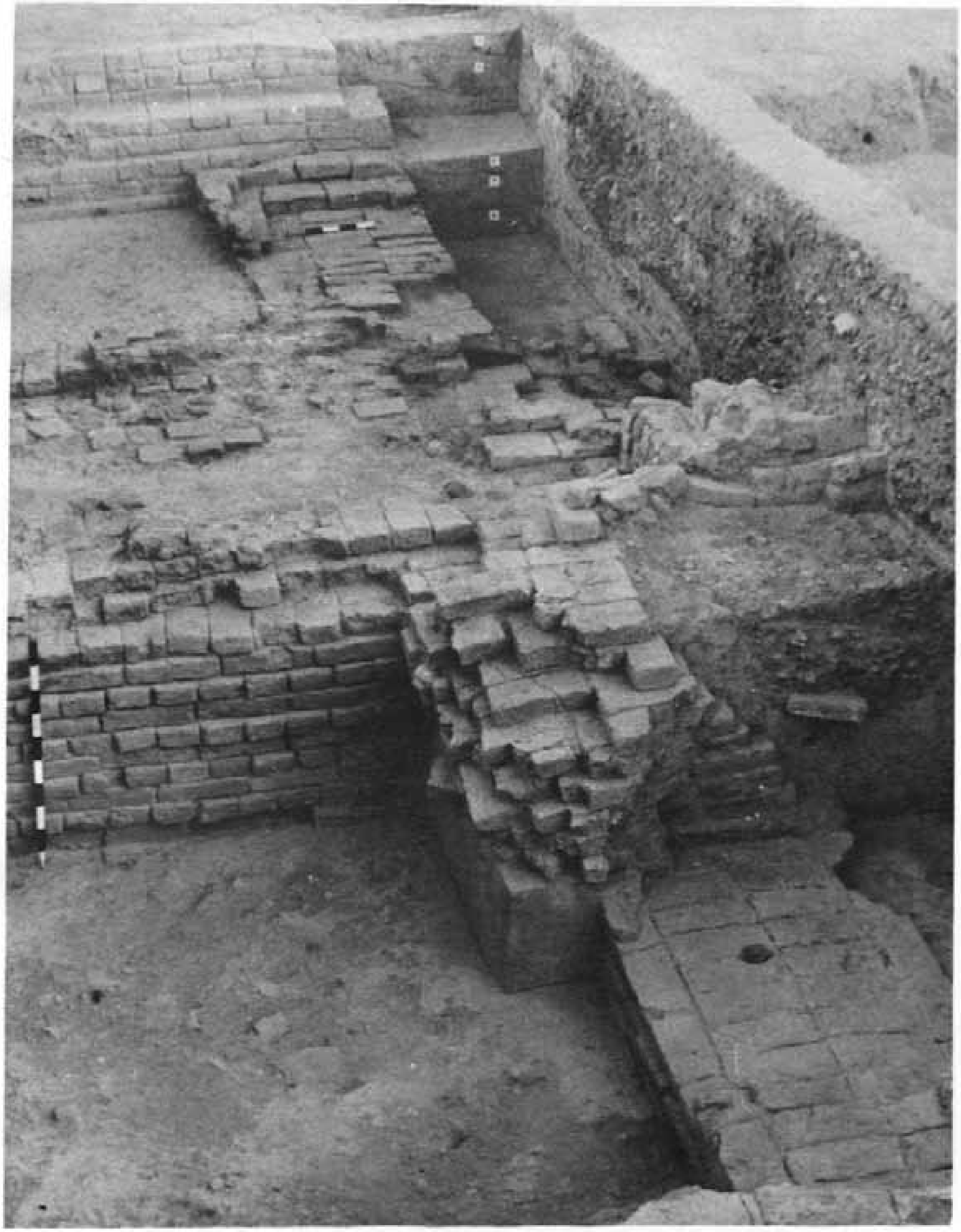
21 Banawali: Clay model of Plough, Period II. *See page 26*



22 Banawali: An engraved stele, Period II. *See page 26*



23 Banawali: Gate complex with associated streets and sectors, Period II. *See page 27*



24 Banawali: A part of mud brick defensive wall Period II. *See page 27*



27 Banawali: A terracotta sealing, Period II. See page 27



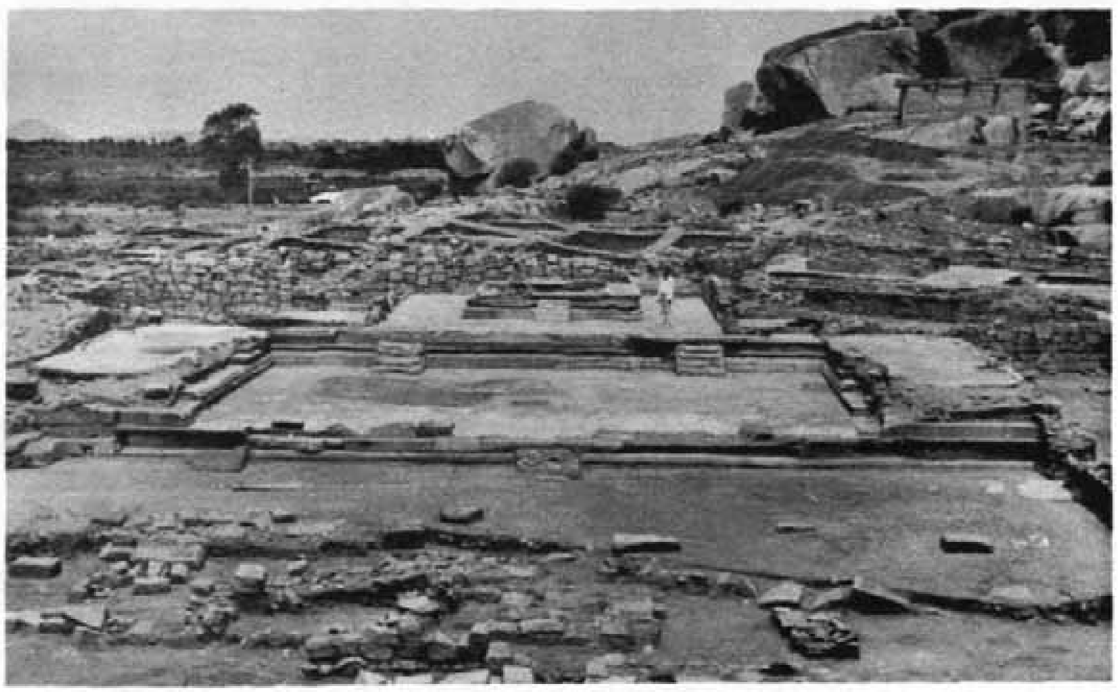
25 Banawali: A steatite seal, Period II. See page 27



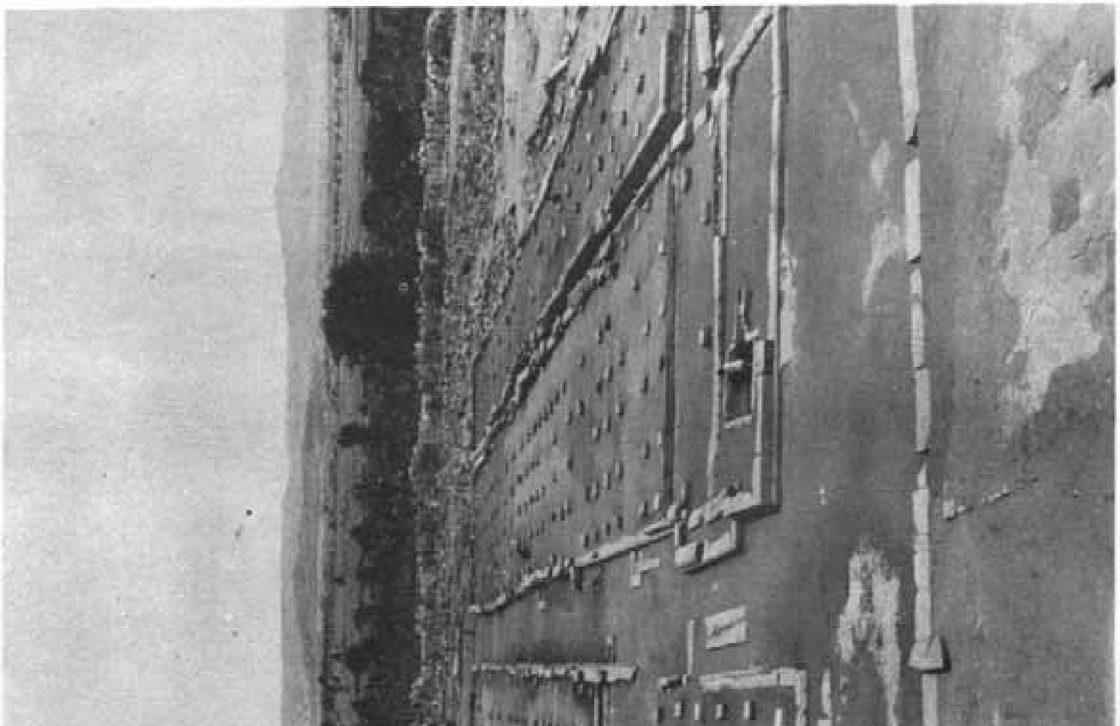
26 Banawali: Steatite seals, Period II. See page 27



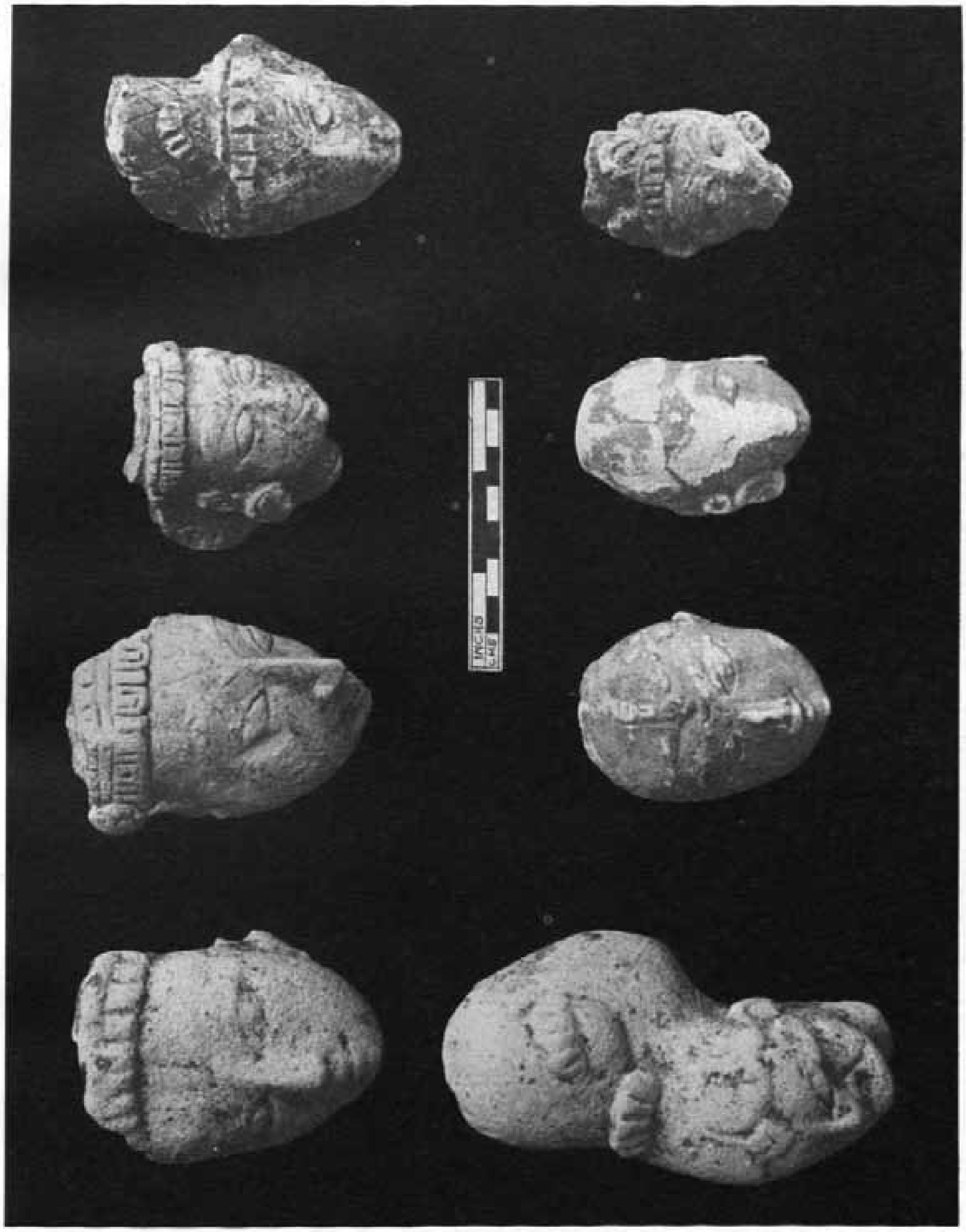
28 Hampi: Noble Man's Palace 3. *See page 36*



29 Hampi: Noble Man's Palace 4. *See page 36*



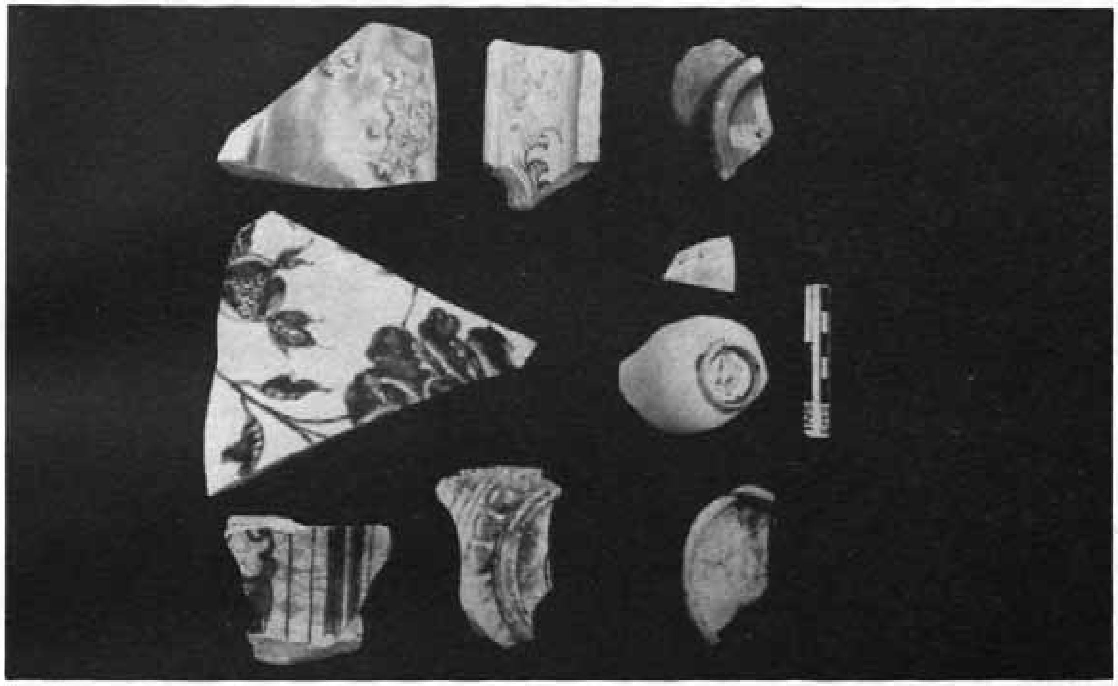
30 Hampi: Structures exposed to the south of King's audience hall. *See page 37*



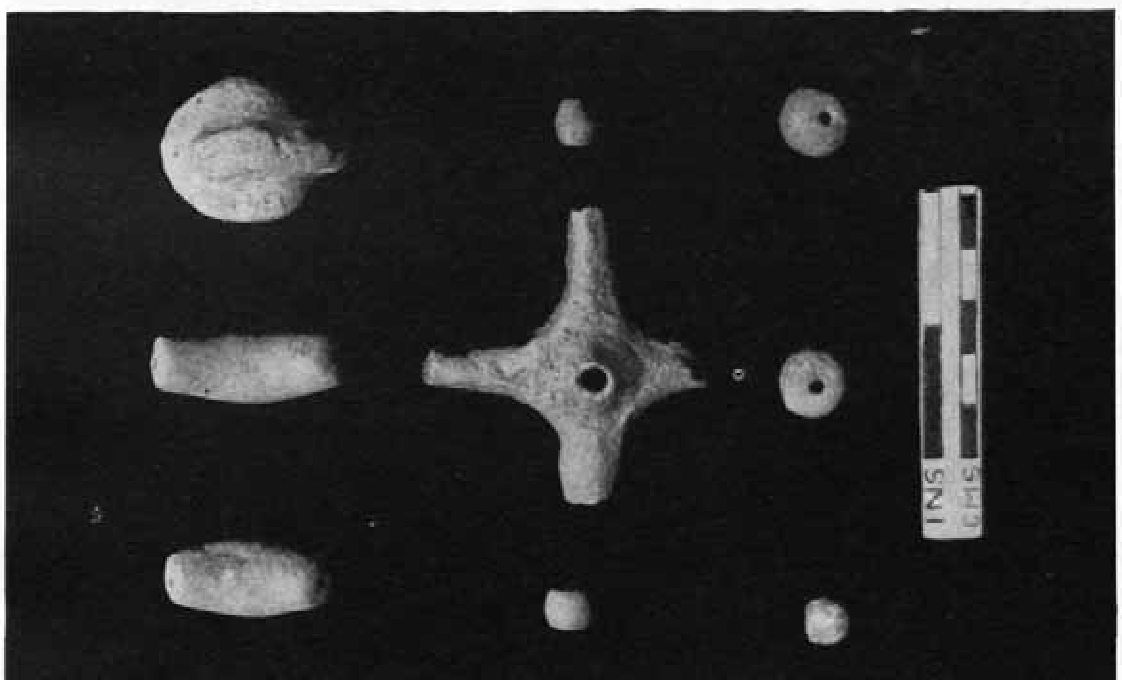
31 Hampi: Stucco figures showing trichurina mark on the forehead. *See page 38*



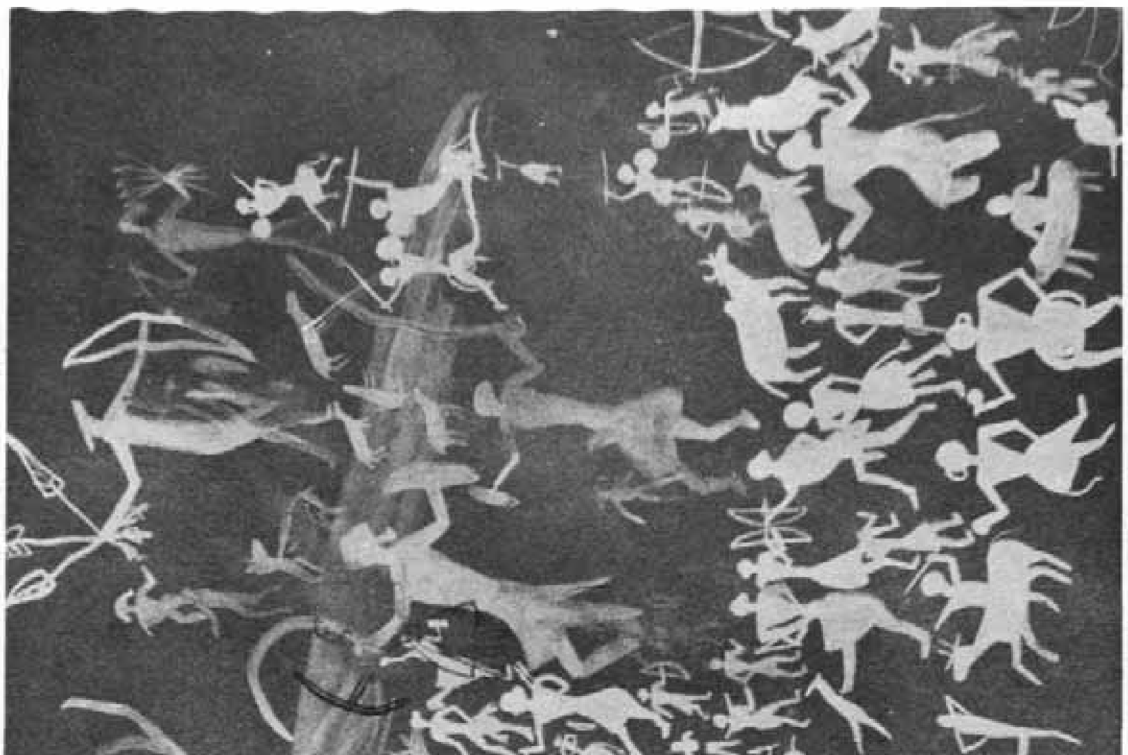
32 Hampi: Fragmentary stone sculptures. *See page 38*



34 Hampi: Chinese Porcelain. *See page 38*



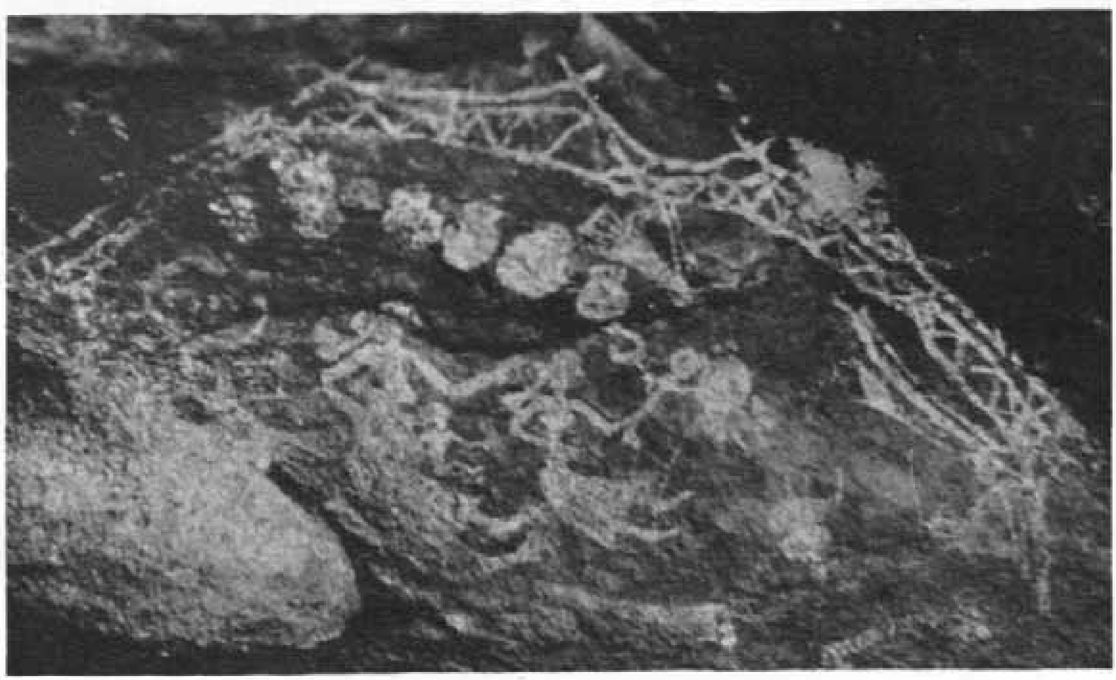
33 Hampi: Terracotta beads. *See page 38*



35 Jambudeep (Pachmarhi): Super imposition of figures of various groups. *See page 49*



36 Jambudeep (Pachmarhi): Warriors. *See page 50*



37 Mahadeo (Pachmarhi): A domestic Scene. *See page 50*



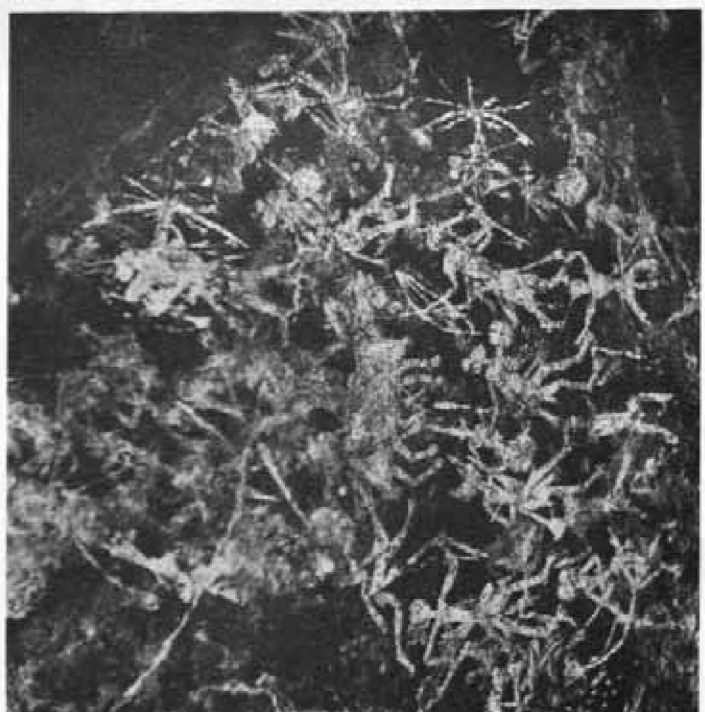
38 Mahadeo (Pachmarhi): A woman suckling the child. *See page 50*



39 Jambudeep (Pachmarhi): Killing of an elephant. *See page 50*



41 Jambudeep (Pachmarhi): A man blowing trumpet. *See page 51*



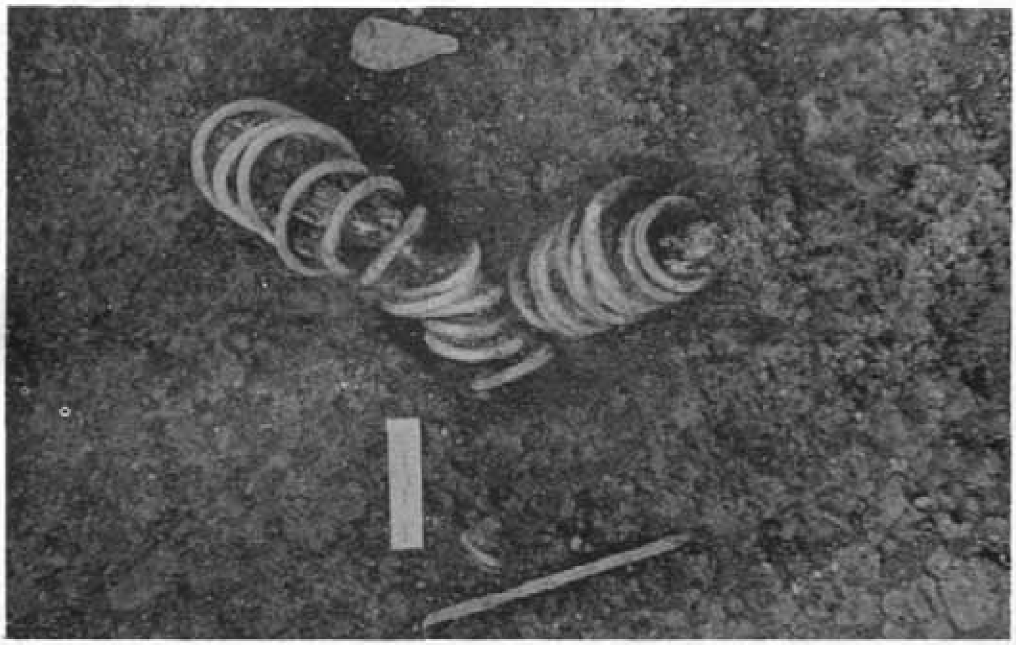
40 Mahadeo (Pachmarhi): A war scene. *See page 50*



42 Nimbubhoz (Pachmarhi): A man playing the harp. *See page 51*



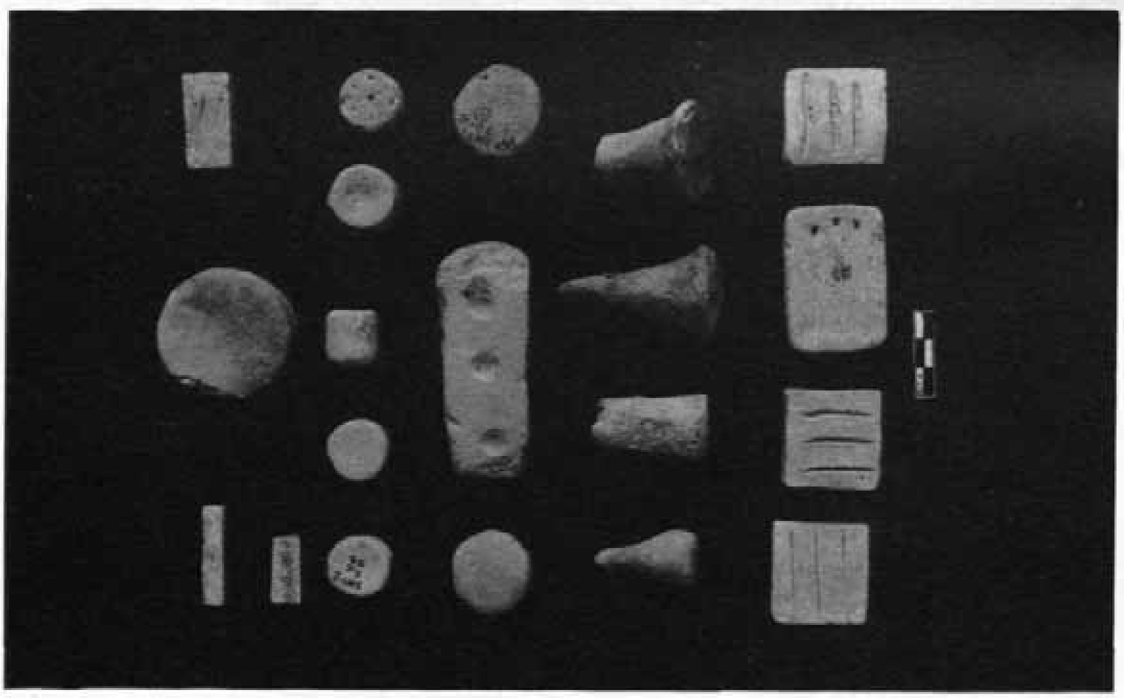
43 Pipilya Lorka: Terracotta stampage. *See page 53*



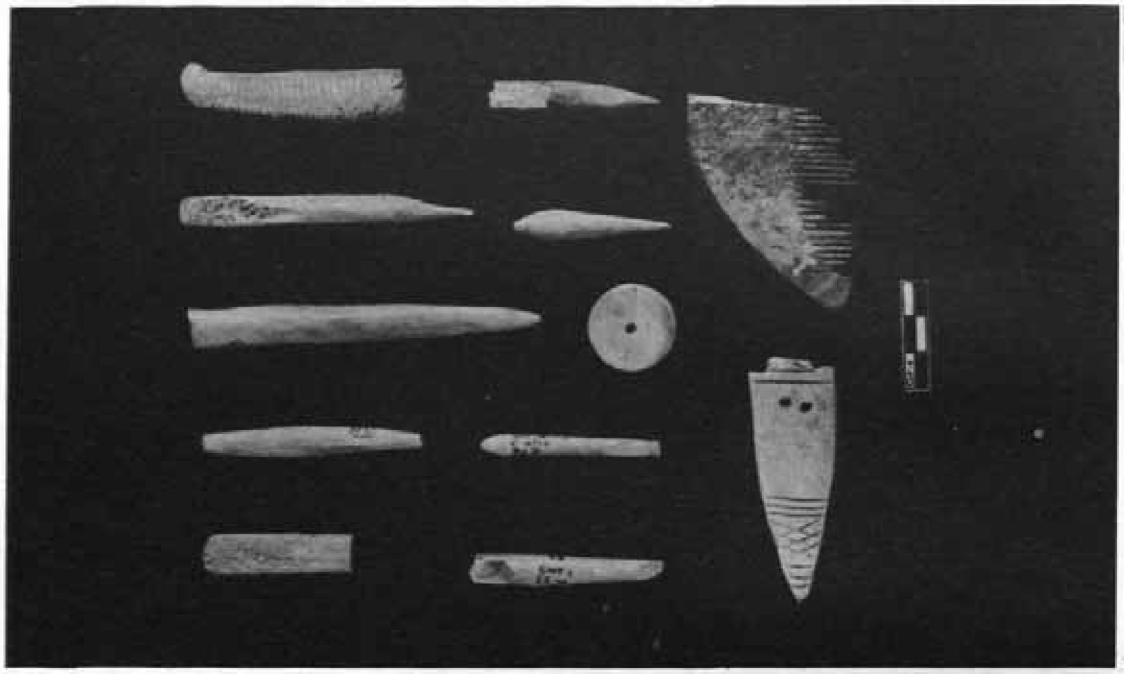
44 Bhagi mohiri: Copper bangles from stone circle, *See page 57*



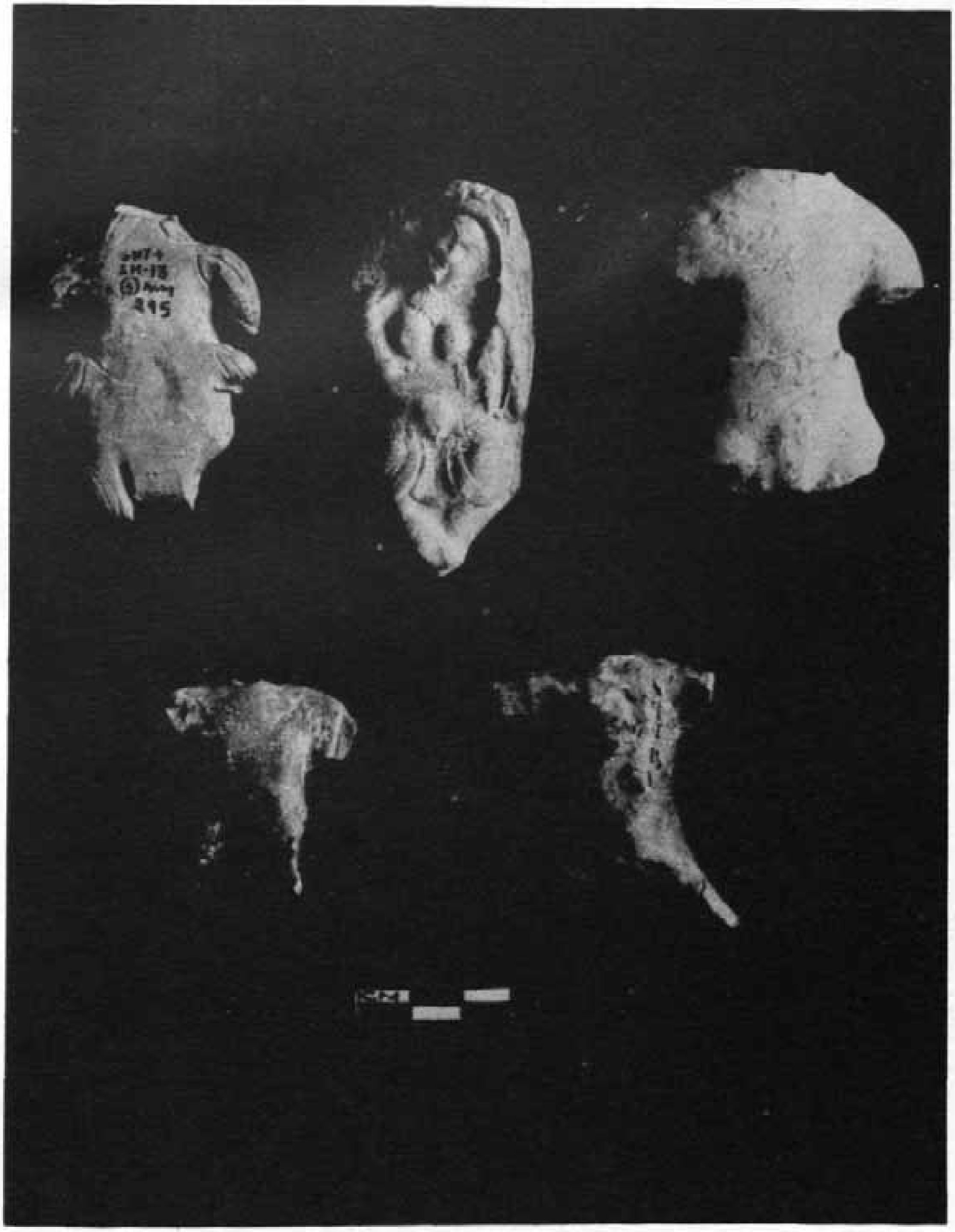
45 Kandhar: The human shaped shrine, *See page 58*



46 Sunet: Games men. *See page 69*



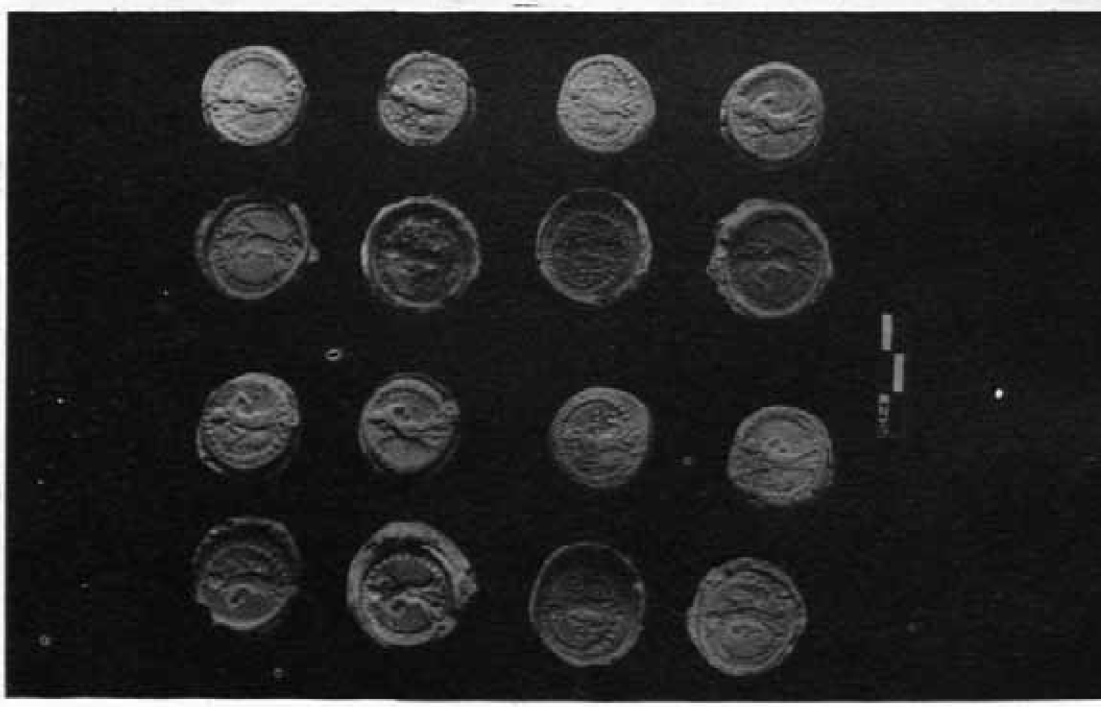
47 Sunet: A bone stylli and other miscellaneous antiquities. *See page 69*



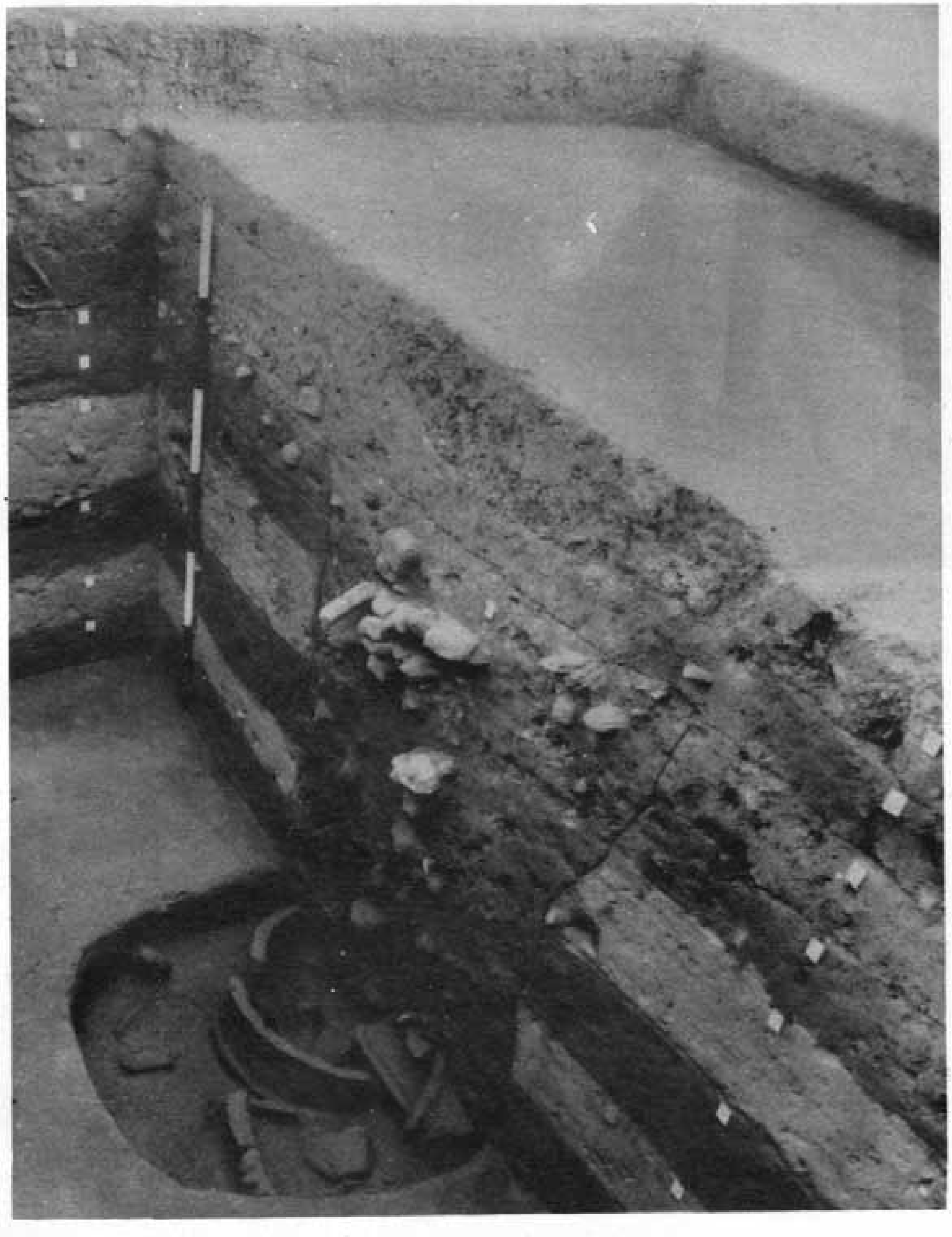
48 Sunet: Terracotta figurine with other terracotta figures. *See page 69*



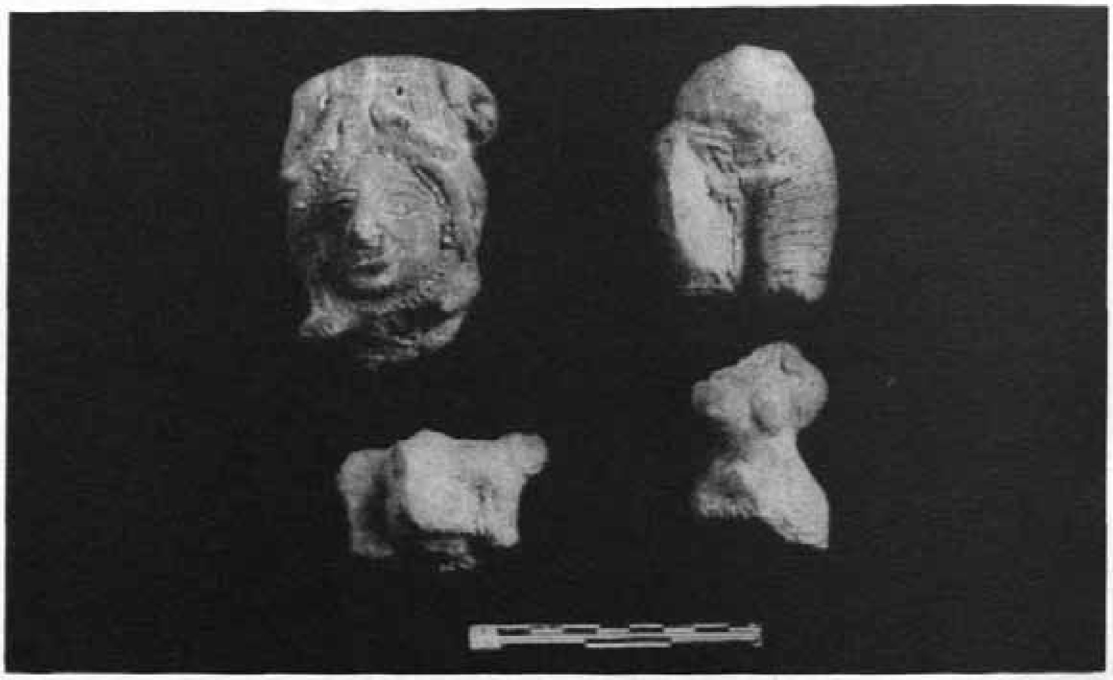
50 Sunet: Seal and sealings, *See page 70*



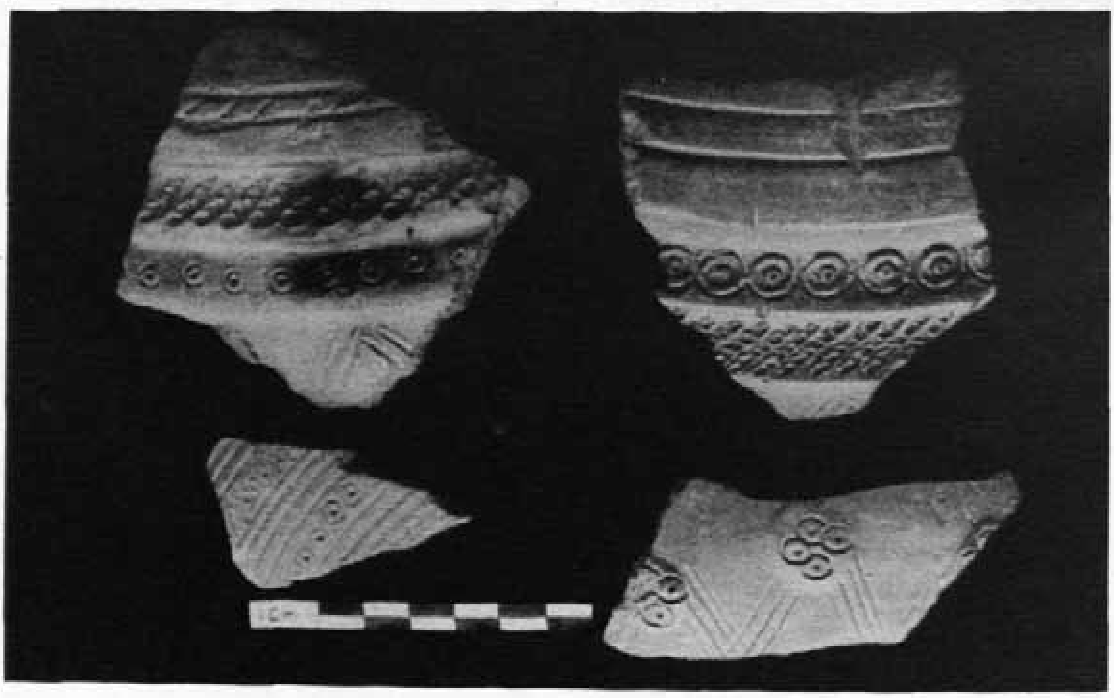
49 Sunet: A hoard of coin-moulds, *See page 70*



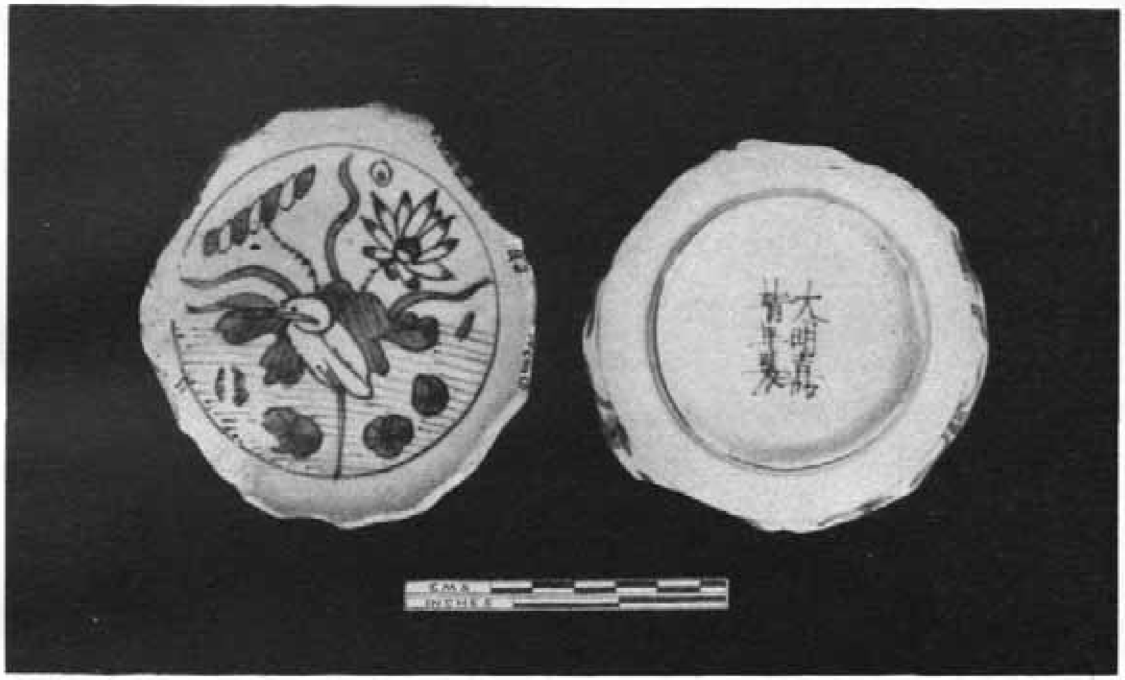
51 Kambaramedu: View showing the soakage pit with rings. *See page 78*



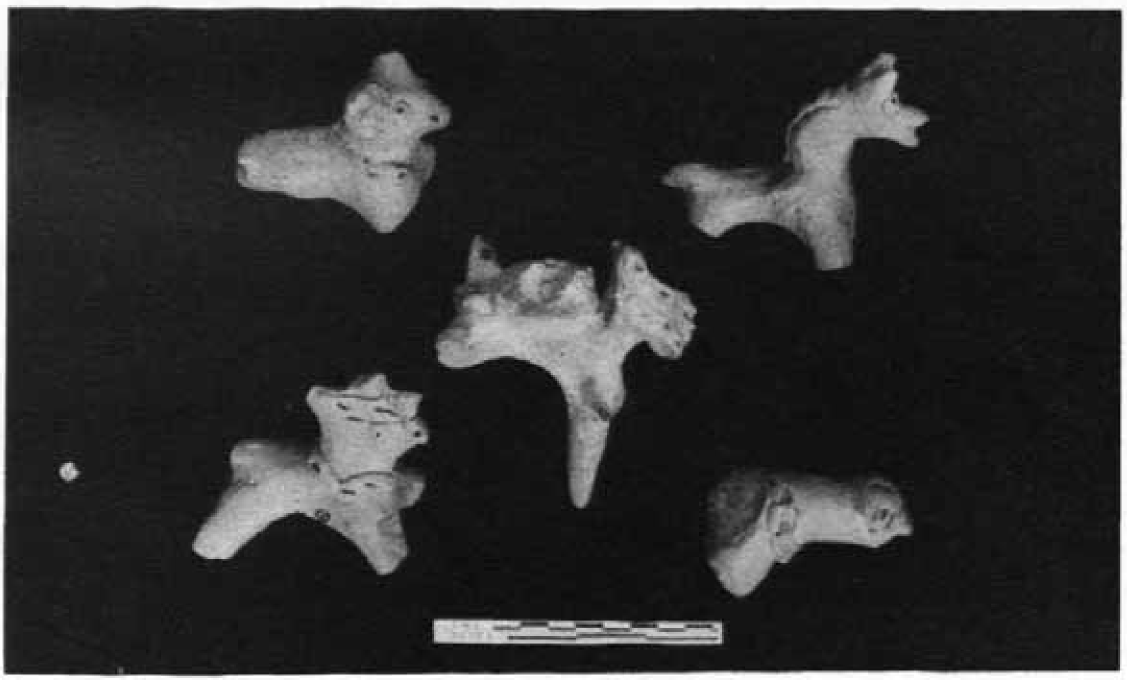
52 Kambaramedu: Terracotta figures, *See page 78*



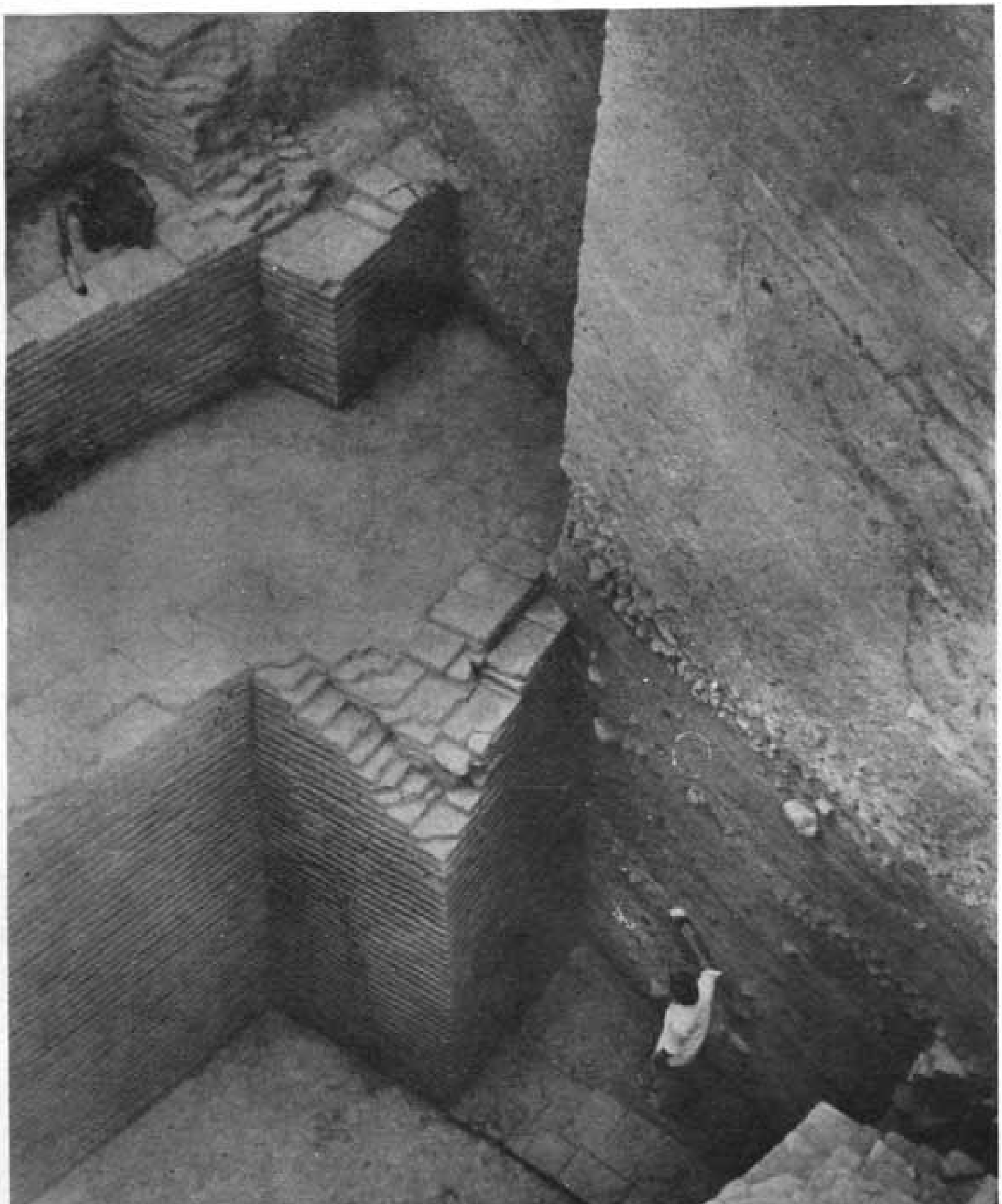
53 Palayarai: Decorated Red Polished Pot sherds. *See page 80*



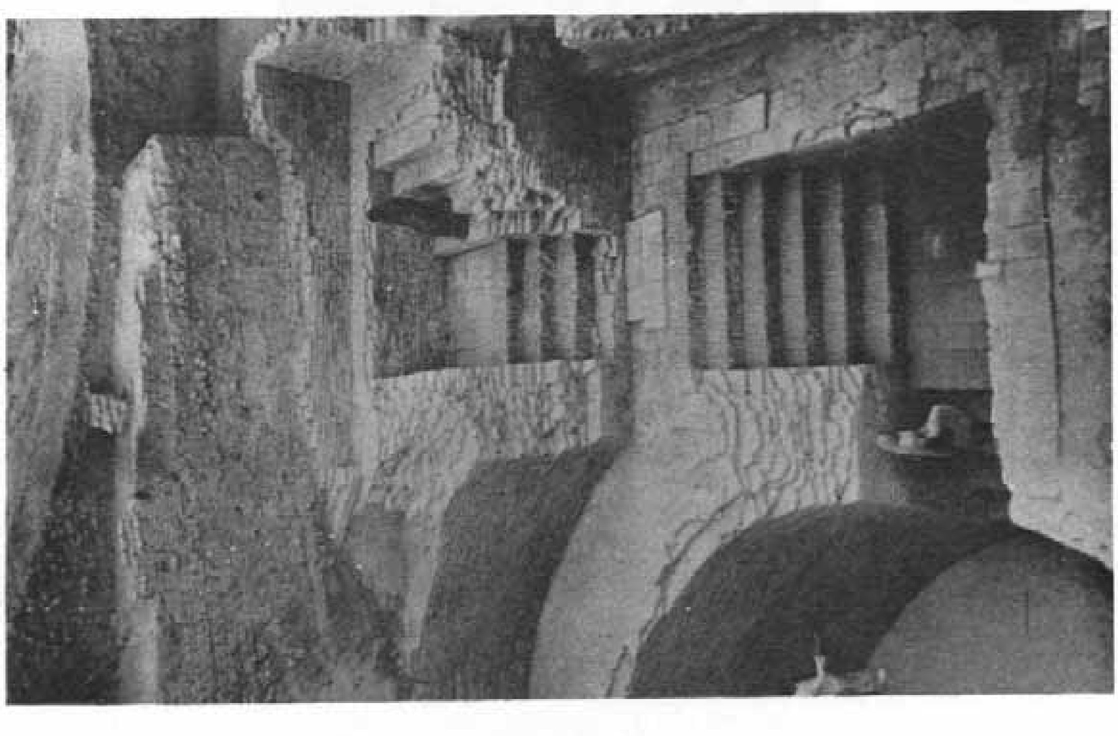
54 Fatehpur Sikri: Chinese porcelain bearing chinese scripts. *See page 84*



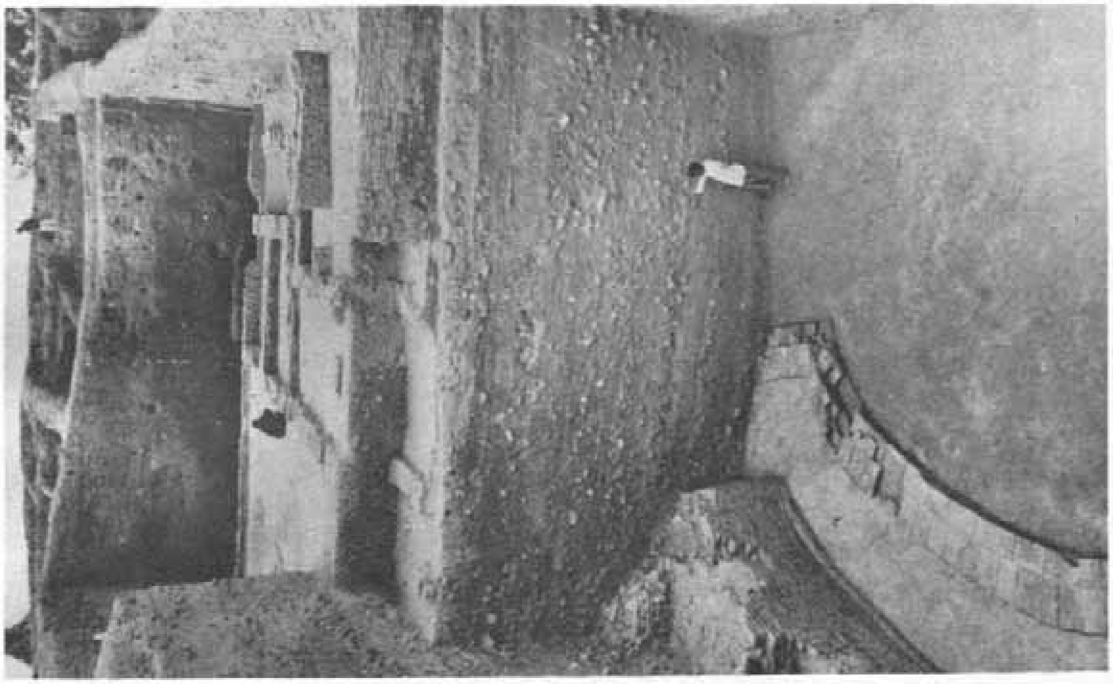
55 Fatehpur Sikri: Terracotta animal figurines. *See page 84*



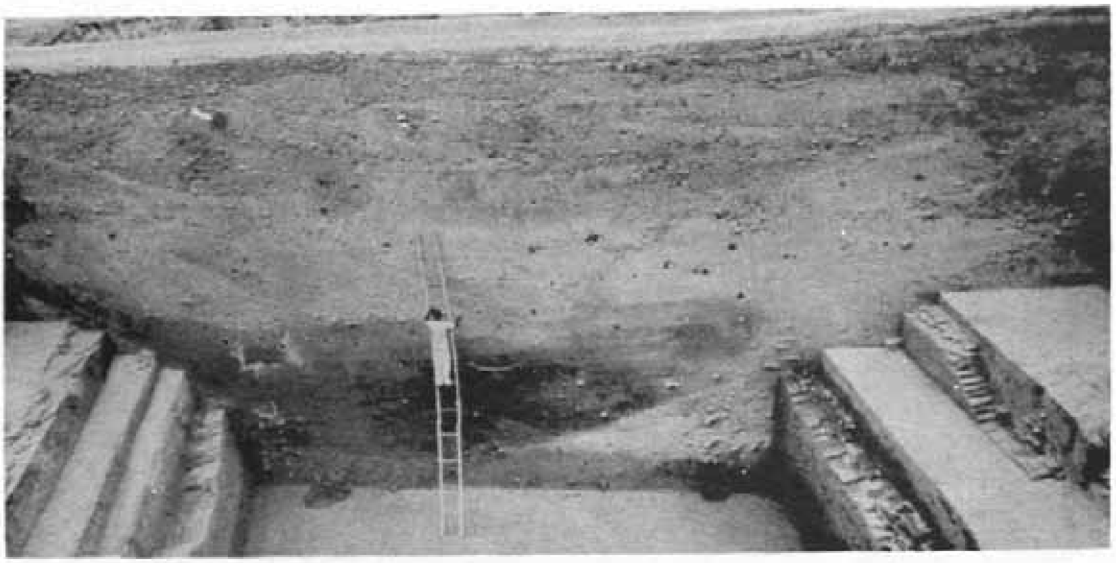
56 Sringverapura: A view of the southern end of tank B where it narrows down to a channel. *See page 84*



57 Sringverapura: A view of the eastern part of the circular chamber. *See page 84*



58 Sringverapura: A view of the western part of the circular chamber. *See page 85*



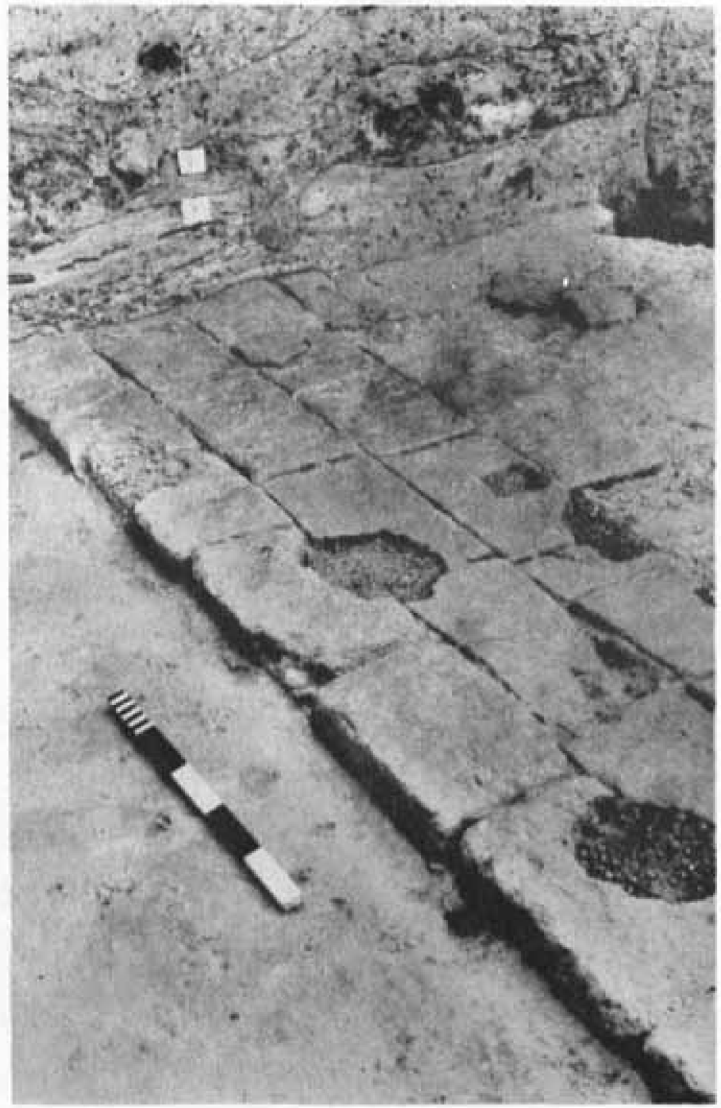
59 **Sringverapura:** Section across tank B on the two sides are the retaining walls. *See page 85*



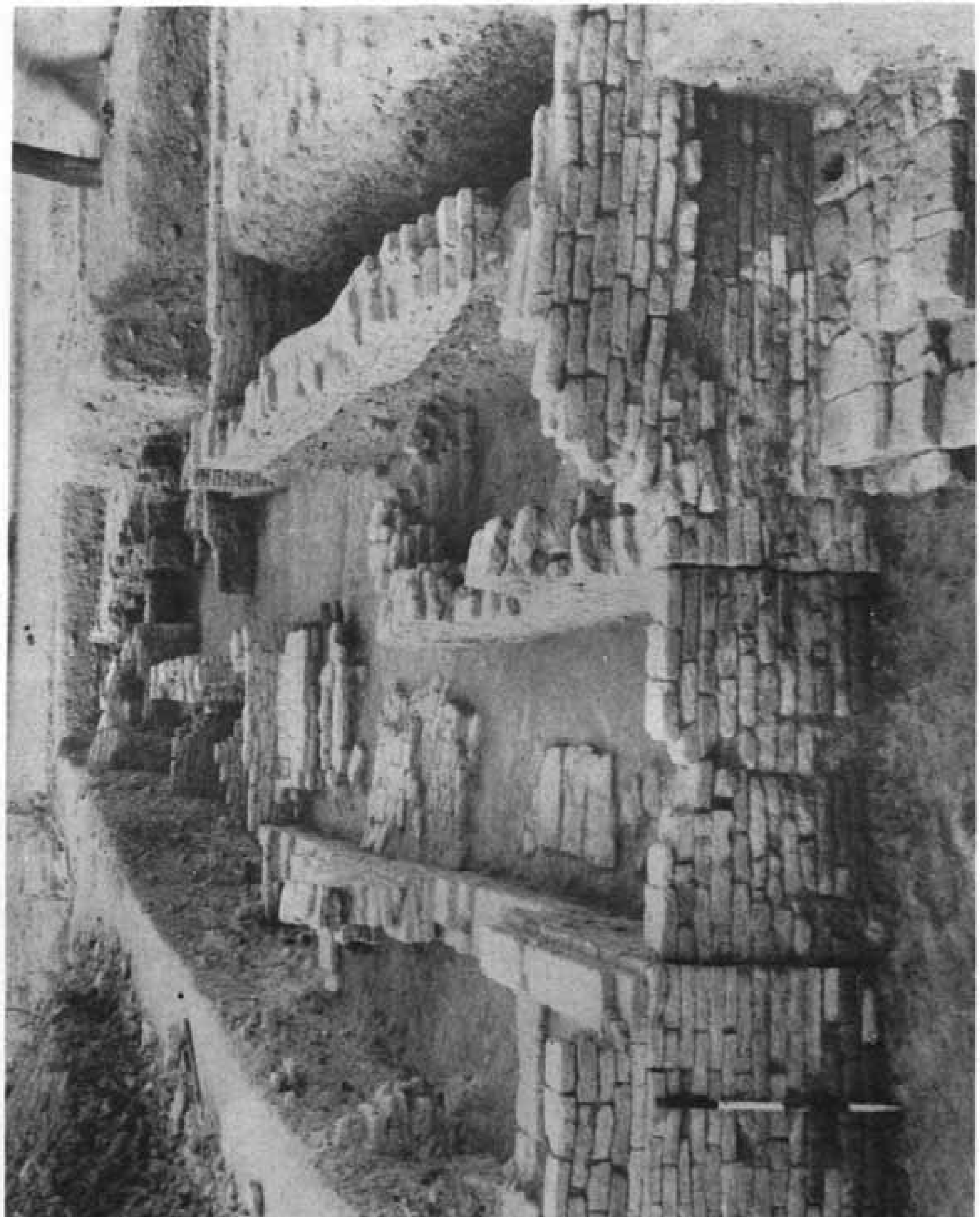
60 Sringverapura: A terracotta sealing in Gupta Brahami characters. *See page 85*



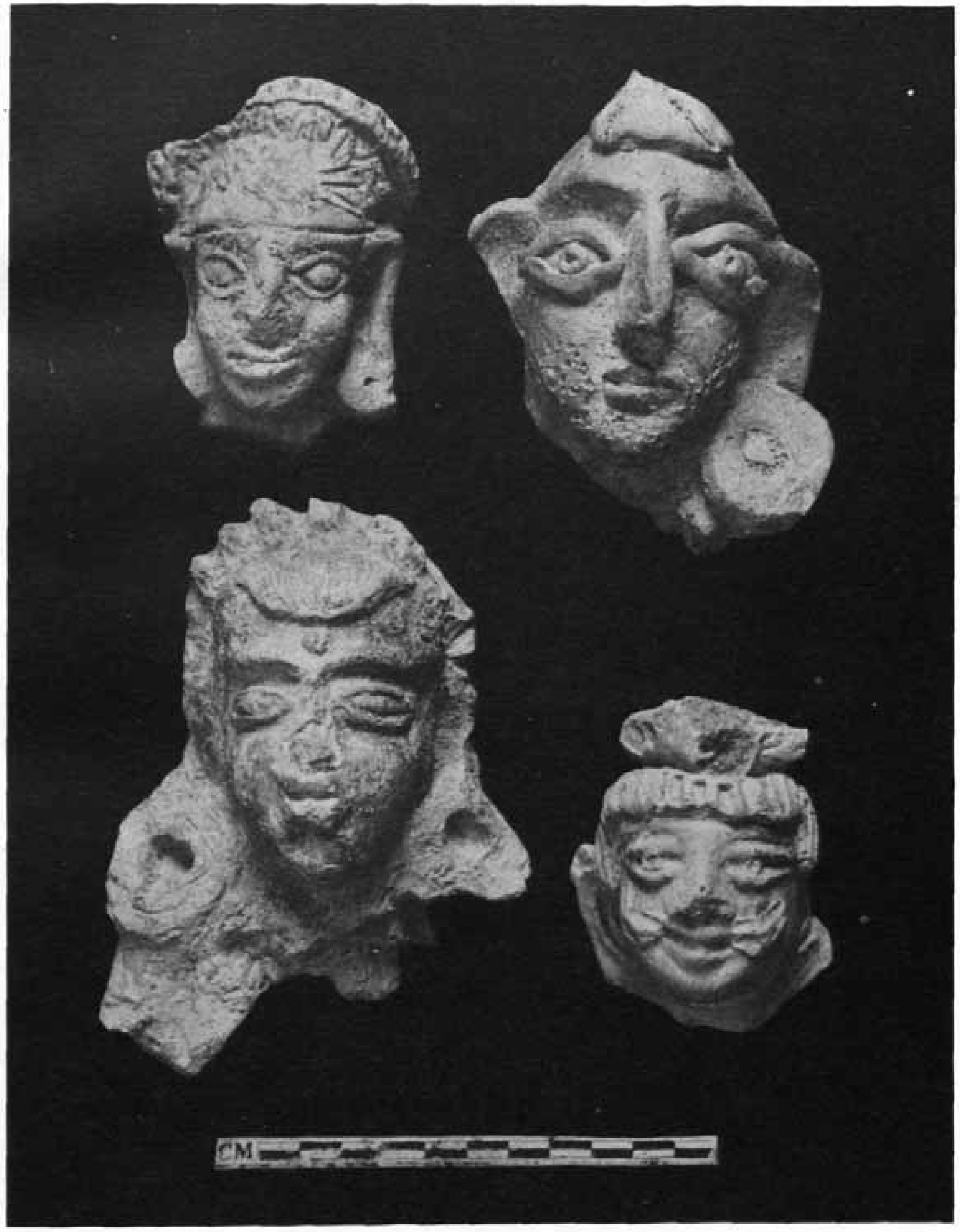
61 Sringverapura: A terracotta figure of a yaksha possibly kubera from the tank. *See page 85*



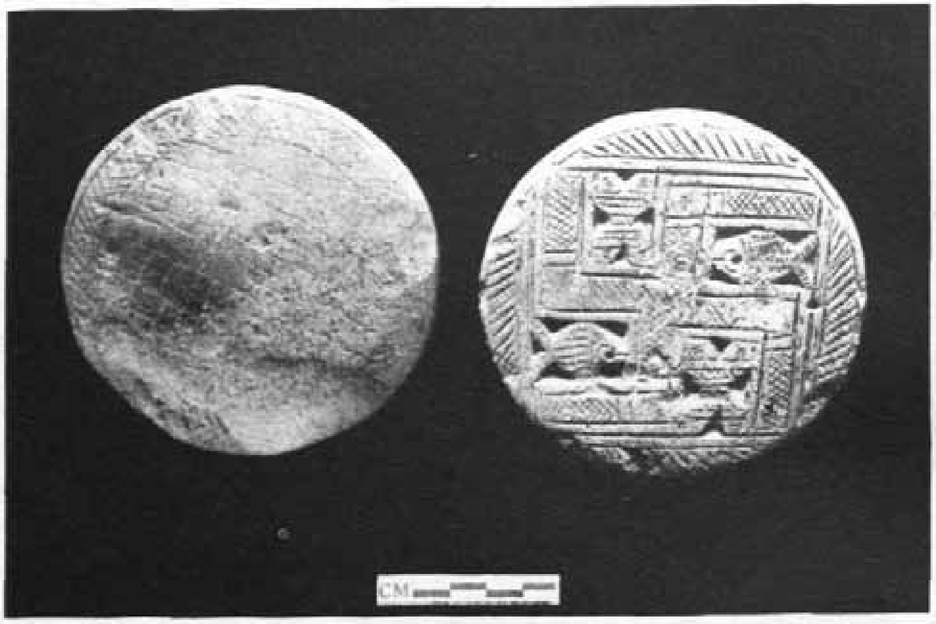
62 Sringverapura: A brick wall with post-holes of an upper NBP Phase. *See page 85*



63 Khairdih: Blocking of a passage. *See page 87*



64 Khairdih: Terracotta human figurines in Kushana style. *See page 87*



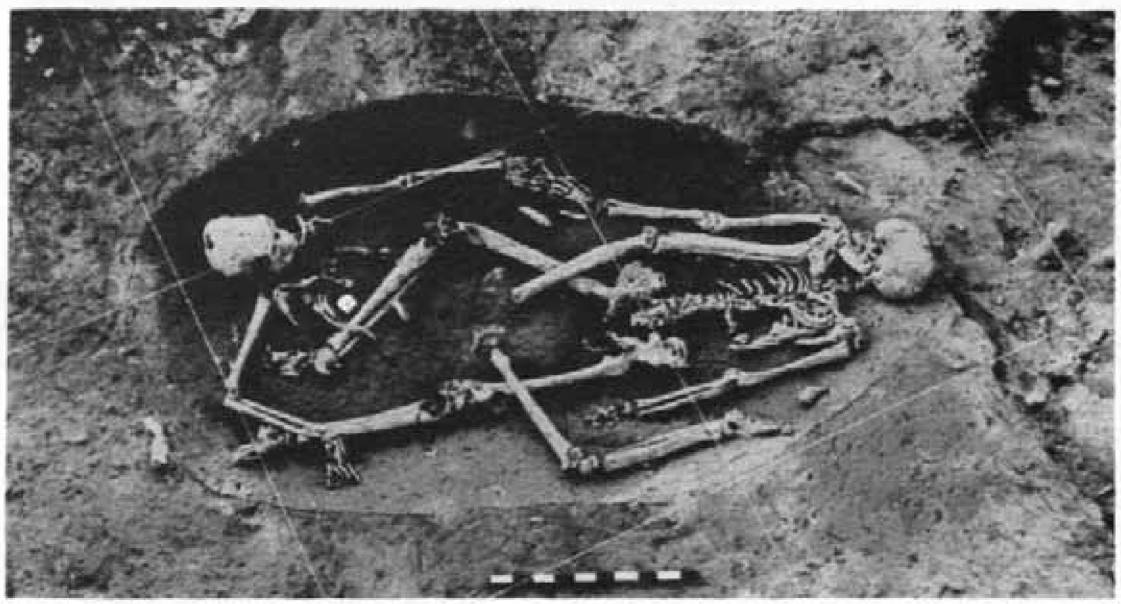
65 Khairdih: A circular wall hanging made of soft stone. *See page 87*



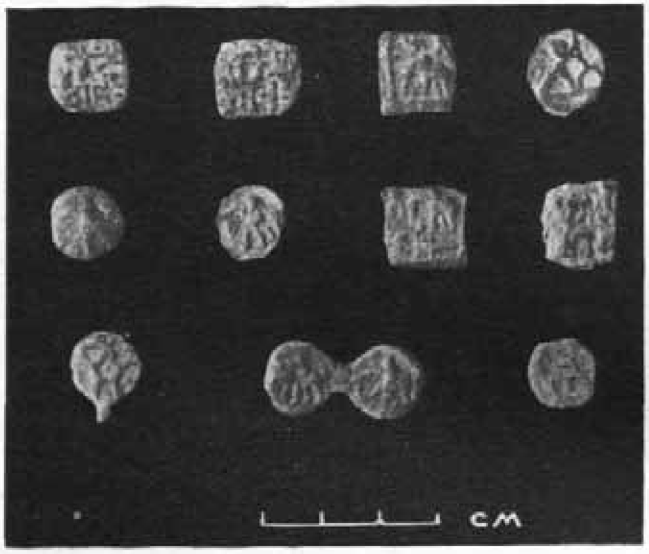
66 Hulaskhera: Storage Jar resting on Kushan floor, *See page 88*



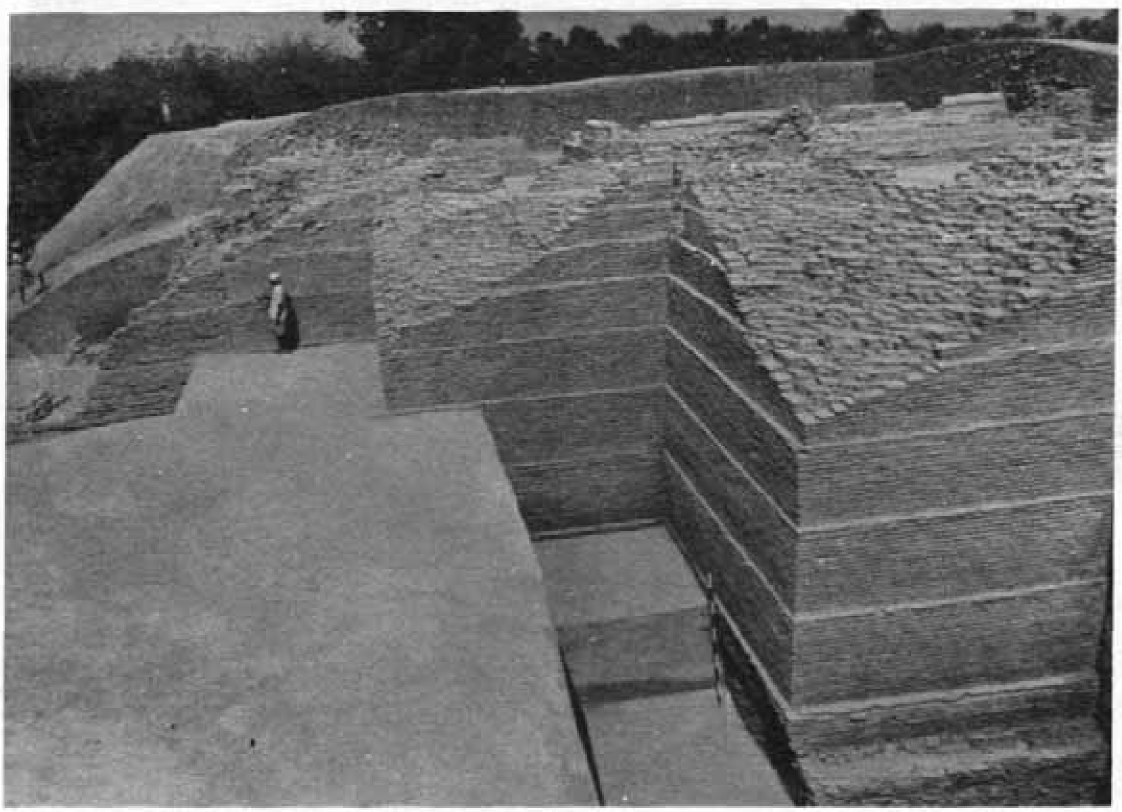
67 Hulaskhera: Collection of burnt grain from the storage Jar. *See page 88*



68 Damdama: Double burial in grave VI. *See page 90*



69 Dihar: Cast copper coins. *See page 93*



70 Ballaldhipi: View of the structure from the south-west corner. *See page 94*



71 Ballaldhipi: View of the two floor levels. *See page 95*



72 Ballaldhipi: Copper objects on floor. *See page 95*



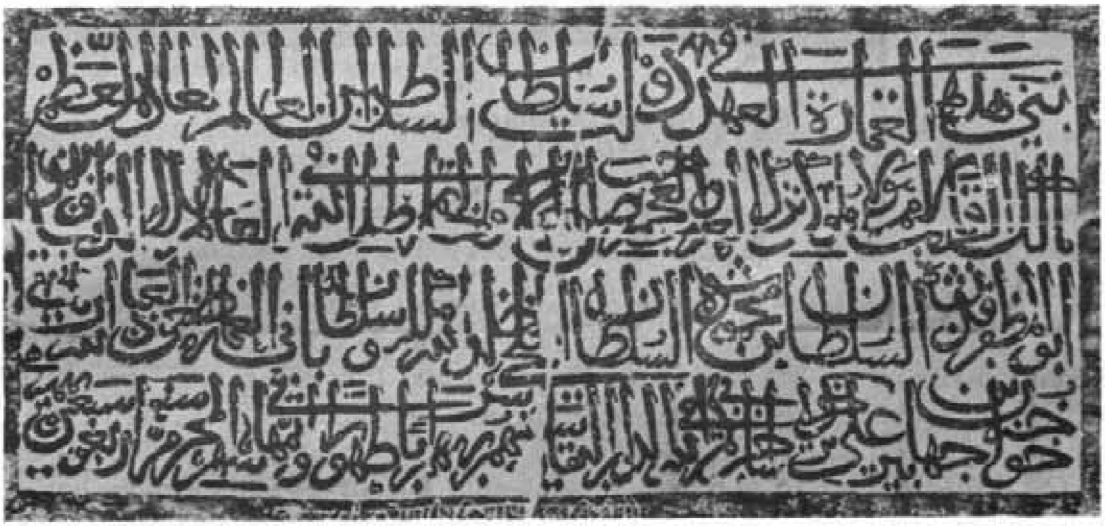
73 Ballaldhipi: Crocodile faced gargayle and a *Kunda*. *See page 95*



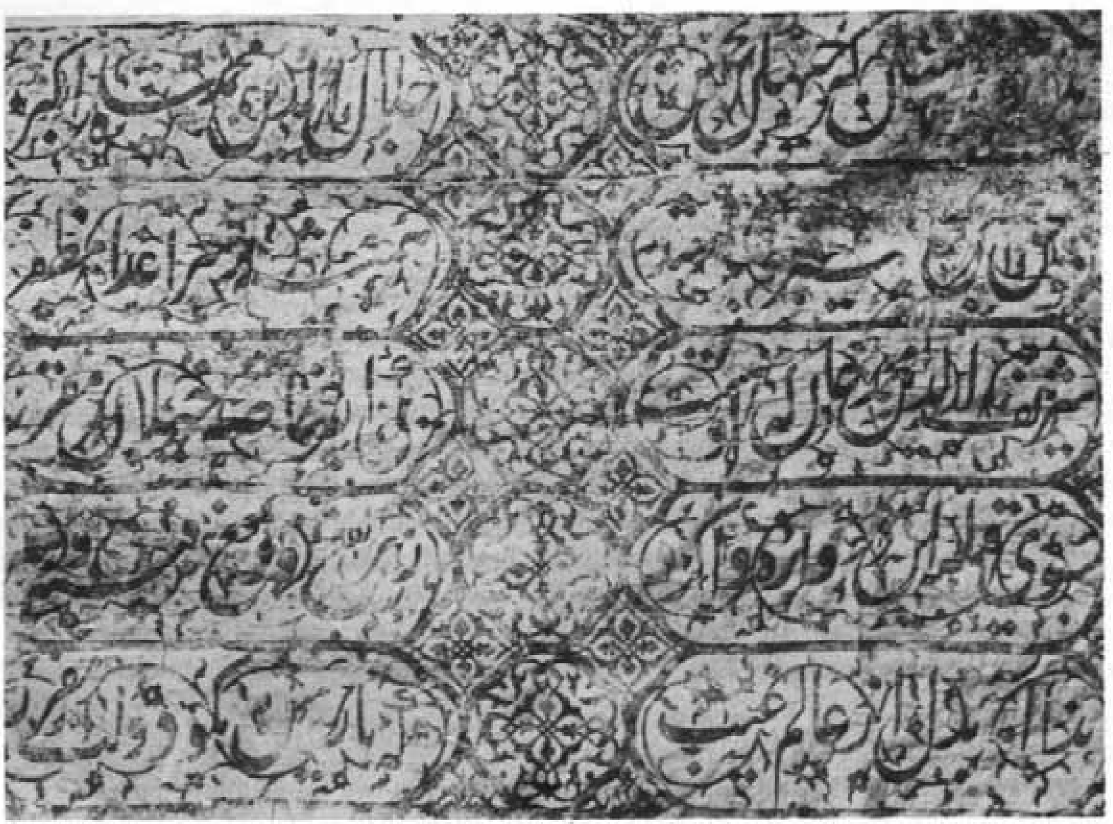
74 Ballaldhipi: Two stucco heads and a stone female head. *See page 95*



75 Ballaldhipi: Image of a *gana*. *See page 95*



78 Rathambhor: Inscription of Fidan Shah. *See page 160*



79 Chunar: Inscription of Akbar, *See page 161*

EPIGRAPHY

Sanskritic and Dravidic Inscriptions[1]

ANDHRA PRADESH

1. Vaidumba Inscriptions, Chinnagottigallu, District Chittoor.— These two hero-stone inscriptions in Telugu language are engraved in Telugu-Kannada characters of the ninth century AD. The inscriptions of the Vaidumba king Manujatrinetra Pallavamaharaju, originally disco vered at Chinnagottigallu are now preserved in the Art Museum at Tirupati, District Chittoor. The first one states that when Vanaraju attacked Podamavi, a warrior named (Gaja) chetaka-pasandi (?), who is mentioned as the son of Mudundla, lost his life in the ensuing battle. The second inscription records the death of two heroes Ereyamurekki, son of Kokkulurekki, and Kaliganru in the conflict at Podamavi fort with Muni (cho)rajununru, son of Mudundla.

2. Prakrit Inscription, Chaitanyapuri, District Hyderabad.— This inscription in Brahmi characters of the fifth century AD, engraved on a boulder at Chaitanyapuri near Hyderabad. It records the establishment of a habitation on the hillock by *Bhadanta* Samghadeva, the water-bearer of the *gamdhakuti* of Govindaraja-vihara. He is described as the disciple of Bamhadeva Thivira of the lineage of vasudeva Siridama, the establisher of the great *vihara,* on the pupha-giri, and *mahapimdapatika* Vamadhara.

3. Two Kakatiya Inscriptions, Ingurthi, District Warangal.— Two Telugu inscriptions belonging to the time of *Mahamandalesvara* Prataparudra are found engraved on a broken stone block lying in the Zilla Parishad High School. Of these, the first one, dated Saka 1214 (AD 1292) refers to the installation of the deity Virabhadradeva and the construction of a temple by Sumkara Amnayabhaktudu and records a series of grants of land and money from tax income towards maintenance and offerings by Malleboyna Bollayangaru and others with the consent of *sakalarnahesvaras,* the 18 *samavas* and the people of the village. It also refers to some grant of land after purchasing the same from Bachajiyya by Amnayabhaktunimgaru.

The second one, dated in the cyclic year Vikari (1300 AD) which is incomplete records the gift of money *(padika)* for maintenance and offerings to the (above mentioned) deity Virabhadradeva of Inumguriki by Deradi-praja and Sena-Praja of *Dasumayya-vada.* This inscri-

[1] Information from: 1-12, 15-32, 47-50, K.V. Ramesh, Director (Epigraphy), who was assisted by MadhavN. Katti, Ram Sharma, M.D. Sampath, S.P. Tewari, M.Jayarama Sharma, K.M. Bhadri, P. Venkatesan, S. Nagar juna and Jaya Prakash, found,copied, examined and reported nearly two hundred inscriptions of which the important ones are noticed here; 13, North-western circle of the Survey; 14, Director, Archaeology and Museums, government of Karnataka,25-43, Western circle of the Survey; and 44-46, Department of Archaeology and Museum,Tamil Nadu.

ption refers to some additional gifts of money, accruing from taxes, and land by the 56 *desas parivaras* and *kampulu* for the same deity.

GUJARAT

4. Seven Stepwell Inscriptions, Museum and Picture Gallery, Vadodara, District Vadodara.— Dated in Vikrama 1256 (AD 1199) the first inscription, in the Sanskrit language and Nagari characters, records the renovation of a stepwell called *Suryavapi* by Vikramasvami, son of the brahmana Somesvara and his wife Nagasri. The pedigrees of Vikramasvami from his mother's and father's sides are also given. The eulogy was composed by Sarvvadeva. Sambala, son of Devadhara, was the architect.

The second one, dated in Vikrama 1514 (AD 1457), refers to the reign of *Rajasri* Nara-yanadasa and records the digging up of a stepwell by *Pam* Buchaka for all beings to quench their thirst.

The third inscription, dated in Vikrama 1532, Saka 1397 (AD 1475), refers to the reign of Sri Bhana and mentions a gift of twenty *drammas* by a certain lady probably for the maintenance of a stepwell built in the village Gora(ni)li.

The fourth inscription, dated in Vikrama 1566, Saka 1431 (AD 1509), records that a stepwell was built by Devaji Bhimaji at the instance of Sri Bharamala, the son of *Maharaya* Bhima m a place called Tantoi. The builder's pedigree is also given and he is stated to be a resident of Visalanagara. The name of the sutradhara is given as Varashamga.

The fifth inscription belonging to the reign of *Maharayaraya Sri* Bharamalla, records the commencement of the digging up of a stepwell in Vikrama 1599 (AD 1542) and the completion of its construction in Vikrama 1600, by *Vyasa Sri* Damodara, *Vyasa Sri* Raghunatha, *Vyasa Sri* Pindara and *Vyasa Sri* Gopala who were the sons of *Vyasa Sri* Srinatha and his wife *Bai Sri* Sahijalade for the satisfaction of all the living beings and welfare of one hundred one generations of their forefathers.

The sixth inscription, dated in Vikrama 1612 (AD 1555), refers to the reign of *Sri* Pum-jaraja the son of Bharamalla and states that his queen Pratapadevi, popularly known as Ruda, built the stepwell on the highway for the welfare of the wayfarers.

The last one is dated in Vikrama 1702, Saka 1567 (AD 1645) which refers to the reign of *maharayanraya Sri* Jagannatha. This inscription gives the genealogical account of a *sutradhara* family in which Pitambara was born. He constructed a stepwell for the welfare of the beings and the salvation of one hundred one generations of his forefathers. Ila-durga, which is mentioned in line 5 of the record appears to be identical with Idar.

5. Mughal Inscription, Museum and Picture Gallery, Vadodara, District Vadodara.— Dated in Vikrama 1655 (AD 1598), this incription in the Sanskrit language and local dialect and in Nagari characters, refers to the reign of the Mughal emperor Akbar. It records some tax exemption given by the emperor *(patasaha)* described in a traditional way as *Samastarajavali -samalamkrita Maharajadhiraja Sri - alabdha - vara - labdha,* also mentioned in the inscriptions

of the Chaulukyas of Anahilavada.

6. Jain Inscription, Museum and Picture Gallery, Vadodara, District Vadodara.- This inscription engraved around a pair of feet *(padukas),* in the Sanskrit language and Nagari characters, is dated in Vikrama 1799 (AD 1742). It pays homage to the *padukas* of *Pam* Sobhagya Vijayagani, the disciple of *Pandita* Sri Sundaragani of the *gachchha* of *Bhattaraka Sri* Vijaya Ananda Suri, the disciple of Bhattaraka Sri *Hira Vijayasuri.*

7. Memorial Stone Inscription, Museum and Picture Gallery, Vadodara, District Vadodara.—Dated in Vikrama 1840 (AD 1783) the inscription, engraved in the Sanskrit language and Nagari characters, refers to the reign of *Maharaja* Sivasimgha and records the death of *Vyasa* Phataichand, son of *Vyasa* Jasakarana, son of *Vyasa* shu(Khu)salachandaji of Pushkarana-*jnati* and Bharadvaja *gotra* on the date given above. It also states that the memorial slab was set up by Haragopala, son of *Acharya Sri* Madanamohana, a resident of Bikaner in Vikrama 1869 (AD 1812). Another date viz. Vikrama 1867 (AD 1810), mentioned in the inscription is perhaps the date of some memorial constructed for the deceased one.

8. Temple Inscription, Museum and Picture Gallery, Vadodara, District Vadodara.— This inscription dated in Saka 1782 (AD 1860) refers to the rule of *Maharaja Sri* Javan Singhji of Iddalapura. It records the renovation of the temple of Mahadeva Sri-Mudhanesvaradeva by *Mahanta Sri* Khema-Bharathi(ti) Bakhata-Bharati along with the renovation of a stepwell, the construction of which was commenced in Saka 1780, Vikrama 1904 (AD 1858) and completed in Vikrama 1916, Saka 1782 (AD 1860). A new *mandapa* was also built by spending rupees five hundred and one. Some more constructions were made by spending some more money. The inscription records a grant of ten *bighas* of land made by *Mahanta* Sri Khema-Bharathi(ti) and his disciples.

9. Kshatrapa Inscription, Kutch Museum, Bhuj, District Kutch.— This Sanskrit inscription engraved on a *yashti* (memorial pillar) in Brahmi characters of the third century AD, brought, from village Kaniabe, Bhuj Taluk, District Kutch, is badly damaged. The inscription refers to the reign of Mahakshatrapa Rudrasimha and possibly records the making of the *yasthi.*

10. Jain Inscription, Kutch Museum, Bhuj, District Kutch.— The column containing this inscription, in the Sanskrit language and Nagari characters, was brought from Devasthali near Vav in Banaskantha District. The inscription dated in Vikrama 1304 (AD 1247), mentions *goshthika* Ranavira and records the making of an image of Sri Parsvanathadeva by Asadeva.

11. Image Inscription, Kutch Museum, Bhuj, District Kutch.— Dated in Vikrama 1484 (AD 1427), this inscription is engraved on the backside of the pedestal of a seated *tirthamkara* image. It records, in the Sanskrit language and Nagari characters, the making of an image of

Sri-Mahavira by a lady named Palhana for her own merit and its consecration by Sri-suri.

12. Tank Inscription, Kutch Museum, Bhuj, District Kutch.— This loose slab found in the mosque at village Lakhond, Bhuj Taluk, District Kutch bears an inscription in local dialect and Nagari characters. Dated in Vikrama 1675 (AD 1618), it records the digging up and construction of a tank by *Rau Sri* Raji and Kaman Bai.

HIMACHAL PRADESH

13. **Ancient Inscription, Bharamaur, District Chamba.—** The inscription with faint letters was noticed on one of the wooden pillars inside the Lakshana (Lakhana) Devi temple at Bharmaur.

KARNATAKA

14. Inscriptions, Hampi, District Bellary.— Out of several inscriptions discovered, the important ones belong to the Vijayanagara King Bukkaraya's period mentioning:

(i) *Vijayanagarada Hebbaqilu* and *Anegomdiya Kottala,* and
(ii) *Somavarada Bagilu* and *Somayadevara Kottala.*
(iii) *Hampaya Kottala,*
(iv) *Hanumana Kottala,*
(v) *Matamgadevara diddi,*
(vi) *Samkaradevara Kottala,*
(vii) *Jadeya Samkaradevara diddi,*
(viii) *Paramesvarana Mata,*
(ix) Hampadeviya diddi,
(ix) *Hampadeviya diddi,*
(x) *Pratapa Kottala,and*
(xi) *Sri Matamgadevara Kottala.*

The study of these inscriptions have revealed the identity of the respective bastions, gates and *matha* mentioned in the inscriptions.

15. Chalukya Inscription, Badami, District Bijapur.— An inscription in two lines found engraved on a rock which forms the part of a roof of a natural rock shelter near Sabara-podi states that the rock shelter *(bila)* was given to a certain Ranakesari by the *mahajanas* at the pleasure of the king Satyasrayamaharaja.

16. Two Early Kadamaba Copper Plate Charters, Sivalli, District Shimoga.— Two inscri-

ptions in Sanskrit language and southern characters of fifth-sixth century AD are now preserved in the office of the Directorate of Archaeology and Museums, Government of Karna-taka. Of which, one records a royal grant of 6 *nivartanas* of land called *niduvol-kshetra* measured by karppatesvara-mana to the east of Bandanike village to the brahmana Ravisvamin of Aupamanyava sagotra, on the full-moon day of karttika in the 7th year of the reign of *Maharaja* Krishnavarmman.

The second charter records a royal grant of a piece of land and l/6th of the revenue income called *karukavimsati* to the brahmana Sankarasvamin of Kasyapa-gotra in the 22nd year of the reign of *Maharaja* Krishnavarmman. While the first charter contains no genealogical account the second charter describes the ruler as the son of Simhavarmman, the son of Kad-ambaraja.

17. Alupa Inscription, Karuppadi, District South Kanara.—This Kannada inscription belongs to the reign of Virapandideva described as *Pandyachakravarti* and *rayagajamkusa.* Dated in Kaliyuga year 4422 (AD 1321), it refers to some activity in the *mandapa* of the tem ple and mentions the *pradhana,* the three hundred of the village and Dombaheggade in that connection. It further registers gifts of money, etc. (details lost).

18. Vijayanagara Inscription, Kollur, District South Kanara.— This inscription, in the Kannada language and characters, belongs to the reign of Virupaksha and is dated Saka, 1404 (AD 1481-82). It refers to the king as ruling from Vidye(a)nagari, mentions his *pradhana* Simgana-danayaka and the *durgadhipati* (name has been lost) of Kolluru and registers grants of lands for the amritapadi-naivedya of the goddess Mukambikadevi of Kollur.

KERALA

19. Vijayanagara Inscription, Mulinja, District Cannanore.— This inscription, in the Kannada language and characters, is dated Saka 1380, Bodhayana (wrong for Bahudhanya), corresponding to AD 1458. It refers itself to the reign of Mallikarjuna, who is eulogised in the record as protecting all the *dharm-asram-acharas* and states that Naraharidevavodeya was administering the Mangaluru-rajya. It records a grant of land, on the occasion of a lunar eclipse, for the daily feeding of three brahmanas (of the place) by Ganapamnavodeya.

MADHYA PRADESH

20. Sati Inscription, Laduna, District Mandasaur.— The inscription, in local dialect and Nagari characters and dated in Vikrama 1761 (AD 1704), belongs to the time of *patasaha* Aurangzeb and the local chief Kesodasa. It records the construction of a platform.

21. Tomb Inscription, Sitamau, District Mandasaur.— This inscription engraved on the central *samadhi* in the *bare-matha* premises is in local dialect and Nagari characters. Dated in

Vikrama 1761 (AD 1704), it records the construction of a *samada* (tomb) during the time of *patasaha* Aurangzeb and the local ruler Kesodasa.

22. Pillar Inscription, Sitamau, District Mandasaur.— This inscription, in local dialect and Nagari characters, is engraved on a pillar in the *mandapa* of the temple of Mahadeva in me *bare-matha* premises. Dated in Vikrama 1775 (AD 1718), it records the construction of a *devaro* (temple) by Bhagawan Garji during the time of Patasahaji Farrukh-Siyar and *(Maharaja)* Kesodasaji. Also mentions *salvata* named Nathuji.

23. Rock Inscription, Devagaon, District Panna.— This inscription, engraved on the rock above the Sankara shrine near the cistern called Ganga-Jamuna, on the hill Devaparvat, in bold nail-headed characters of about the seventh-eighth century AD, reads: *ga utumgasiva.*

24. Sati Stone Inscription, Panna, District Panna.— This inscription in local dialect and Nagari characters is engraved on a stone slab (No. 71) kept in the Rajendra park at Panna. Dated in Samvat 1375 (AD 1318), it records the performance of *sati,* at the village of Mahodra, by the wife of Jave, son of Alhana. The figures of the sun, the moon and a standing lady are engraved to the left of the writing. The record was written by *Pam* Murari.

MAHARASHTRA

25. Prakrit Inscription, Kanheri, District Thane.— This badly effaced inscription in Brahmi characters is engraved on the proper right wall, above a water-cistern in the porch of Cave No. 61. It is dated in the (Saka) year 123 (AD 201), the rest of the details being lost.

26. Prakrit Inscription, Kanheri, District Thane.— Inscribed on the proper right wall of the verandah of Cave No. 22 in Brahmi characters of the second-third century AD, it records the making of the cave and the water-cistern by a lay female disciple (name has been lost) of the *Thera Bhandanta* Sanghamitra.

27. Prakrit Inscription, Kanheri, District Thane.— Inscribed in Brahmi characters of the second-third century AD on the proper right wall in the porch, to the proper left of the cistern of Cave No. 75, it records the making of the cave (lena) and also the institution of a permanent endowment (details lost) by Lavanika the wife *(gharini)* of *Gahapati* sethi Ayala, the son of Sulakhana, a lay disciple from Kalyana *(contra.*S. Nagaraju, *op.cit* p. 335, No. 31).

28. Prakrit Inscription, Kanheri, District Thane.— Inscribed on the proper left of the verandah of Cave No. 16 in Brahmi characters of the second-third century AD, it records the gift of the site *(kheta)* and also the institution of a permanent endowment by Mudapala, the son of a lay devotee Sivarakhita, along with his father, wife and the children *(contra.* S. Naga raju, *op.cit.,* p.334 No. 12).

29. Prakrit Inscription, Kanheri, District Thane.— This partly damaged record, in Brahmi characters of the third-fourth century AD, is engraved above the cistern to the proper left of Cave No. 81. It appears to record the donation of the cave *(lena)* by Sethi (Pushya) mitra of Kalyana (?) for the merit of his forefathers *(pitaranam). (contra.* S. Nagaraju, *op.cit.,* p. 336 No. 33).

30. Prakrit Inscription, Kanheri, District Thane.— This partly damaged record, in Brahmi characters of the third-fourth century AD, is engraved above the inner side of the water-cistern located on the proper left-side of Cave No. 93. (PI. 76). It records the making of the water-cistern *(paniya-podhi)* for the use of Thera Dharmaghosha by the nun Dharmadevi (Dhama-devikiniya), the daughter of the horse-trader *(assavanika)* Sivatana *(contra.* S. Nagaraju, *op.cit,* p. 336,No.37).

31. Prakrit Inscription, Kanheri, District Thane.— This partly effaced inscription, in Brahmi characters of the first-second century AD, is engraved above the cistern to the proper right to cave No. 101. (Pl. 77). It appears to record the donation of the *lena,* and water-cistern and also the institution of a permanent endowment for the welfare of the monks of *chatudisa-bhikku-sangha* residing at Kanheri *(pavatakanhasela)* by the lay devotee Sivadata of Kalyana. Besides, it also refers to Dadhikani of Kalyana itself and the donation of money *(pana)* for satra and the cost of *chivara (pana-mula chivarika)* for the monks residing at Kanhagiri *(contra.* S. Nagaraju, *op.cit,* p.336 No. 41).

32. Commemorative Inscriptions, Kanheri, District Thane.— Twenty-nine Prakrit inscrip tions, in Brahmi characters of the fifth-sixth century AD were discovered from the debris of the ruined brick stupas of Kanheri. The contents of these inscriptions are more or less identi cal. They record the names of several *theras* and *arhantas* in whose memory the *stupas (thubha)* were built.

33. Nagari Inscription, Kanheri, District Thane.— This short inscription in Cave No.3 in two lines bears the date Samvat 953, obviously of the Saka era, corresponding to AD 1031 and merely mentions one Dasavarmma, the son of Tailapeya. In view of the date of the record this Dasavarmma may be identified with one of the sons of Taila II of the Chalukya dynasty of Kalyana.

34. Stone Inscription, Paunar, District Wardha.— A fragmentary stone inscription from the village Paunar of the reign of Burhan Nizam Shah is inscribed in Nagari characters in bold relief during the Suhura Era 1000. It is a stone showing the direction to some village, the name of which can not be made out as the lower portion has been broken away and is missing.

RAJASTHAN

35. Inscription, Awa, District Pali.— These four Nagari inscriptions on the *sabhaman-*

dapa pillars of the Siva temple bearing Samvat 1132, 1168, 1229 and 1260, (AD 1075,1111, 1272 and 1203) record the construction of the temple and its repairs.

36. Inscription, Bagrinagar, District Pali.— An inscription bearing Samvat 1624, (AD 1567) records the performance of *Sati.*

37. Inscription, Dhakri, District Pali.— This inscription of Samvat 1626 (AD 1569) records the death of a Rajput.

38. Inscription, Dhanderi, District Pali.— The inscription in Nagari dated Samvat 1648, (AD 1591) records the death of a Kumawat Rajput, resident of Dhanderi.

39. Inscription, Dudhor, District, Pali.— This fifteen-lined inscription dated Samvat 1462, (AD 1405) records the donation of land and a well for the village by Dip Singh, Gulab Singh, Jivan Singh and Amar Singh Rathor.

40. Inscription, Hariamali, District Pali.— This inscription bears date Samvat 1676 (AD 1619) and records the donation of land and the construction of a Vishnu temple by Thakur Guman Singh.

41. Inscription, Rairakalan, District Pali.— This is a Nagari inscription bearing Samvat 1607, (AD 1550) recording the performance of *Sati.*

42. Inscription, Surainta, District Pali.— This Nagari inscription bearing Samvat 1615 (AD 1558) is engraved on a pillar of the *garbha-griha* of a Siva temple, which records the repairs carried out to it.

43. Sati Inscription, Udeka, District Pali.— A two-lined inscription in Nagari, dated Sam vat 1672 (AD 1615), records the performance of *Sati*

TAMIL NADU

44. Copper Plate Inscription, Rajakkappati, District Madurai.— This copper plate grant, dated AD 1667, records the gift of land by the king of Madurai, Tirumalai Naicker, for maintenance of a watershed which was installed by Thiruthevan Peyarthevan. The grant was made by the king when his two brothers made a request buy offering flowers of gold and silver. The inscription also mentions that the watershed was situated near the *Kovalan* channel.

45. Copper Plate Inscription, Uthappa Nayakanur, District Madurai.— This copper plate was issued during the reign of Thirumalai Naicker, the ruler of Madurai in the seventeenth century AD, as a "Kolaimaniyam" (endowment for murder). It records the gift of land by a

Zamindar to a barber, Alagiri Naicker who went in disguise to Thirumalai Naicker's Court and got murdered. While Thirumalai Naicker was staying in Araiyur Taluk, he wanted to marry the daughter of Sappani Durai, Uttappa Naiyakar, the Zamindar of Uttappanayakkanur. The Zamindar refused. Then the Nayak tried to abduct the girl, but on coming to know this the Zamindar took a vow that he would kill the Nayak if he abducted his daughter. Hearing this the Nayak called him to his court. But the Zamindar sent his barber, Alagiri Nayakkan in disguise to the Court. Then Alagiri Nayakkan was murdered. In his memory, Uttappa Nayakan endowed a gift of land as "Kolaimanyam".

46. Hero Stone Inscription, Ereltimalai, District Periyar.—This hero-stone inscription in' two lines reads *Turakai Ullarukal* "meaning the stone belongs to the man who took ascetic life and died". The inscription, on palaeographical grounds dateable to the fourth century AD, is now in possession of the State Department of Archaeology.

47. Four Pandya Inscriptions, Mudikkarai, District Ramanathapuram.— Of the four Tamil inscriptions, the first one engraved in the *mandapa* of the Perumal temple, dated in the fourteenth regnal year of Maravarman Sundarapandya, records the assignment of the tax, *Kadamai* to the god *Udarapriya-vinnagar-emperuman,* the rights of cultivation *(karanmai)* to *Narayanan* and the institution of a festival on the day of the natal star of the king *viz.,* Uttiram in the month of Panguni. Among the boundaries of the gifted land, a highway to Madurai is referred to.

Dated in the 10th regnal year of Jatavarman Sundarapandya, the second inscription, found on the east wall of the *mandapa,* refers to the dedication of the toddy-tappers (Sanrar) viz., Raman-nambi and his two sons to the temple of Udarapriya-vinnagar-emperuman at Mudikkarai by the village assembly *(uravar)* which had raised ten *panam* by the sale of 20 veli of land in public auction, being the amount to be paid to these three individuals.

The third inscription on the beam of the *mandapa* is dated in the fourth regnal year of Jatavarman Vikramapandya. It records the sale of old *devadana* lands belonging to various temples in the village to four individuals (names given) with stipulation to enjoy the *karanmai* rights of their respective shares and to pay the *kadamai dues* to the temple for instituting a festival, the expenses of which were to be met from the income therefrom.

Engraved on the door-jambs of the central shrine, the fourth inscription belongs to the reign of Maravarman Kulasekhara. Dated in the eighth regnal year, it records the gift of the village Sulamani-nallur which was earlier a *tiruvidaiyattam* of Udarapriya-vinnagar-emperuman of Mudikkarai as *Kant* to the brahmanas and the collection of some *Kasu* for the proposed repairs of the temple as the said endowment became defunct and uncultivable prior to the renewal.

48. Pandya Inscription, Tondi, Dintrict Ramanathapuram.— This Tamil inscription, engraved on the wall of the *mandapa* of Chidambarisvara temple, records the endowment of 41/2 *ma* of land called *Masilamani-vayakkal-parru* as *devadana* to the deity Mukti-Vinayak-

pillaiyar, installed on the eastern bank of the tank Marakulam by Avudaiyan-nayan of Nara-singa-mangalam. The famous port-town Tondi is referred to as Pavittiramanikka-Pattanam while enumerating the common *devadana* lands of the temples.

49. Vatteluttu Inscription, Paraiyanpattu, District South Arcot.— Engraved on a rock called *Sunaipparia* in the village, this inscription, in Tamil language and *Vatteluttu* characters of the fourth-fifth century AD, records that "this is the memorial(*nisidikai*)"of Aradan, the disciple of Va(ch) chanandi Acharyan of Panadu, who gave up his moral coils by fasting unto death.

50. Two Chola Inscriptions, Thanjavur, District Thanjavur.— Of the two Tamil inscrip-tions, one engraved on the northern enclosure wall behind the *Amman* shrine, records the gift of a golden *tali* and *pattaikkarai* with weights specified by the local *Adavallan* standard to the goddess Umaparamesvari enshrined in the *tiruchchurrumaligai* in the temple of Rajarajesvaram-udaiyar by two different individuals viz., Arrur-udaiyan Nakkan, the *Srikaryam* of the temple till the twenty-ninth year of Rajaraja I, and Iravipalur-udaiyan, a vellala of Sattankudi who was holding the offices of the official engraver of the inscriptions of the temple, *Kudurai-chevagam,* and *Sirudanam* during the third year of Rajendra I, thereby showing that the twenty-ninth year of the father synchronized with the third year of his son.

The second inscription dated in the third regnal year of Rajendra I and engraved on the tier of the Pillaiyar shrine on the western enclosure, records the gift of images of Peruchchali (rat), the vehicle of the god Alayattu-Pilliayar-Ganapati and the bhutam (goblin) and they were caused to be made by Poygainattukkilavan Adittan Suriyan *alias* Tennavan Muvendavelan, the *srikaryam* of the temple. The iconometric details of these images are given meticulously.

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. Inscription, Chanda Sharif, District Adilabad.— The epitaph records the death of Yusuf Khan in A H 1168 (AD 1754-55).

2. Inscriptions, Nirmal, District Adilabad.— Of the five guns found at different places, two mention the name of their manufacturer Muhammad (son of) Qasim and the rest mention the name Zafaru'd-Daula, the companion of Ruknu'd-Daula and the date AH 1185 (AD 1771-72). According to an inscription from the same place, a mosque was constructed in AH 1195 (AD 1780-81).

3. Inscription, Masai Peth, District Adilabad.— This epitaph records the martyrdom of a saintly person named Shah Burhan in AH 1215 (AD 1800-81).

[1] Information from:N.M. Ganam, Superintending Epigraphy of the Survey, was assisted by M.F. Khan, Deputy Superintending Epigraphist, S.S. Hussain and M.Y. Quddusi, Senior Epigraphical Assistants and M.I. Quddusi, Epigraphical Assistant, who found, copied, examined and reported on two hundred and one inscript-tions during the year. Of these, important ones are noticed here.

BIHAR

4. Inscription, Arrah, District Bhojpur.— This epigraph records the construction of a mosque in AH 1233 (AD 1817-18) by Mahbub Bakhsh.

5. Inscription, Piro, District Bhojpur.— The epigraph records the construction of a mosque in AH 1048 (AD 1638-39) by one Mir Haidar.

6. Epitaph, Akbarpur, District Rohtas.— This epitaph refers to the death of Sayyid Ali in AH 1049 (AD 1639-40).

7. Inscription, Chain pur, District Rohtas.— Re-examination of this known record *(Tarikh-i-Sahasaram,* p. 127) confirmed that the date of the construction of a mosque by Neknam was AH 1036 (AD 1626-27) and not AH 1336 (AD 1917.18).

8. Epitaphs, Darbhanga, District Darbhanga.— Belonging to the scions of the Mughal family of Delhi settled at Darbhanga, the deceased mentioned in the three epitaphs are : Nawwab Rif'at Sultanu'z Zamani Begam daughter of Mirza Muhammad Bakht, a descendant of 'Azizu'd-Din Alamgir II. She died in AH 1304 (AD 1887) at the age of 14 years and 6 days, Nawwab 'Azimu'n-Nisa Banu Begam daughter of Mirza Muhammad 'Azimu'd-Din Bahadur who was the descendant of Muhammad Shah Alam II. She died in AH 1314 (AD 1896) at the age of 58 years and Mirza Hamid Sultan a descendant of Shah Alam II. He died in A.H 1320 (AD 1902).

GOA

9. Inscription, Velha Goa, District Goa.— The inscription records the completion of a bastion called *burj-i-Ali* in the time of the Khan of the high rank, Bahadur Khan, the *naib-i-ghaibat* (Deputy-in-absence) of the mu'amala (territory) of Guva (Goa) in the Shahur year 990, AH 998 (AD 1590).

GUJARAT

10. Mughal inscription, Nikol, District Kheda. — This loose metrical inscription recovered from a nearby field refers to the Governorship of Aurangzeb. It states that when the leader of the turbulent people named Haj rose in rebellion, Aurangzeb ordered Barkhurdar to chastise him. In the encounter that followed, Haj was caught with his arms. It further states that Barkhurdar after his victory over this turbulent leader erected this fort in AD 1055 (AD 1645-46.)The text was written by Hidayatu'llah whose cognomen reads like Nahvi.

11. Inscription, Ankleshwar, District Bharuch.— This epigraph records the construction

of an 'Idgah in AH 1209 (1794-95) at a cost of 1025 rupees.

12. Miscellaneous inscriptions, Kapadvanj, District Kheda.— The first epitaph records the death in AH 1009 (AD 1601) of Khauj son of Malik who served the two Da'udis (i.e. Da'ud-bin-'Ajab Shah and Da'ud-bin-Qutb Shah, respectively the 26th and 27th Da'is of the Daudi Bohra community). The second metrical epigraph records the construction of a mosque in AH 1265 (AD 1848-49) in the time of Najmu'd-Din (42nd Da'i of the Da'udi Bohra community). A group of epitaphs in the Bohra graveyard probably set up in the recent times mark the last resting places of the leading men of the community. Some of the deceased mentioned are: Maula'i Miyan Fir, son of Yusuf, the *Hafiz* of the Quran and the pilgrim of two holy places (i.e. Mecca and Medina (d. AH 1072 AD 1661), Muhyu'd Din Muhammad 'Ali (d. A H 1092/ AD 1681), Dusa Bhai, son of Qasim, son of Hasan and, Miyan Mu'min son of Jiva Khan son of Khanji (d. AH 1131/AD 1718).)

MADHYA PRADESH

13. Mughal inscriptions, Vidisa, District Vidisa.— This slightly damaged record of Aurangzeb dated A H 1107 (AD 1695-96) states that after the death of her husband named Khairu'd-Din, *Saudagar* (Merchant), Bibi Maru(na?) constructed a mosque and a step-well at a cost of three thousand and five hundred rupees. An epitaph from the same place records the death of a person (name not given) in the fortieth regnal year of Aurangzeb (AD 1696). An epigraph from the same place records the construction of a mosque for the sake of God by Pir Khan in the forty-seventh regnal year of the king evidently Aurangzeb).

14. Miscellaneous inscriptions, Vidisa, District Vidisa.— The damaged epigraph records the construction of a mosque for the sake of God in AH 1092 (AD 1681). Another epigraph from the same place, records the construction of a mosque by La'I Khan (?) in AH 1174 (AD 1761). According to an epitaph from the same place, Dost Muhammad Jama'dar Maidan (?) died in AH 1233 (AD 1818). It also invokes the favour of Miran Muhyiu'd Din Qadiri.

MAHARASHTRA

15. Faruqi inscription, Nandurbar, District Dhule.— The inscription on a Gun states that this gun of auspicious victory was (manufactured) in the fort in AH 961 (AD 1553-54) at the order of Mubarak Shah (II) son of 'Adil Shah (III) Faruqi.

RAJASTHAN

16. Inscription of the Sultans of Malwa, Sunel, District Jhalawar.— This inscription of Mahmud Shah (I) Khalji records the construction of a mosque in the town *(qasba)* of Husam-

pur *alias* Sunel by Husamul-Mulk son of Sa'du'1-Mulk in AH 871 (AD 1466-67).

17. Inscription of the Sultans of Malwa, Barod, District Kota.— Belonging to the reign of Mahmud Shah (I) Khalji, this fragmentary epigraph refers to the construction of a step-well and a garden in the town *(Qasba)* of Barud (i.e. Barod). Its date is unfortunately lost.

18. Inscription of a scion of Malwa Sultan, Ranthambhore. District Sawai-Madhopur.— This interesting and historically important inscription originally found from a step-well at Alanpur in the same district records the construction of a building (i.e. a step-well) in A H 874 (AD 1469) by Khwaja Jahan son of Bir 'Ali Turk Khurasani in the reign of 'Alau'd-Dunya wa'd-Din Abul-Muzaffar Fidan Shah a's-Sultan son of Mahmud Shah (I) Khalji. (PI. 78) Historical works however do not mention Fidan Shah as independent king (?).

19. Inscriptions of the Mughals, Kota, District Kota.— This is the only record of emperor Akbar so far found here. The epigraph records the construction of a mosque in AH 977 (AD 1569) by Mir Ali Akbar. Its chronogram was composed by Wa'iz and the text was written by Muhammad. Another epigraph from the same place records the construction of a mausoleum of Sayyid Hakim in AH 1053, V S 1700 (AD 1643-44) during the reign of Shah-jahan.

20. Mughal inscription, Baran, District Kota.— This inadequately published inscription of emperor Aurangzeb *(Safarnama-i-Mazhari,* p. 209) was on re-examination found to record the completion of a mosque during the governorship of Sayyid Muhammad Wasi' the *Amin,* in regnal year 23, AH 1091 corresponding to V S 1737 (AD 1680) by Muhammad Shafi Mazan-darani. Its text was written by 'Abdu'I-Ghani son of Muhammad Wasi 'Alavi.

21. Inscriptions of the Nawwabs of Tonk, Pirawa, District Jhalawar.- Two epigraphs of the same purport belong to the time of Aminu'd-Daula Waziru'l-Mulk Nawwab Hafiz Muham-mad Ibrahim " 'Ali Khan-Bahadur Saulat Jang. They record that a *Sarai* was constructed in AH 1317 corresponding to V S, 1956 (AD 1899-1900) for the welfare of the people under the supervision of Captain governor of Padawa (i.e. Pirawa) through the efforts of Seth Ummid Mai, Seth Kanahyya La'l, Seth Jagnath, Seth Ramchandar, Seth Gopi Kishan, Seth Girdhari La'l and other opium merchants. The text was written by Sayyid Zaki Hasan *Gir-dawar Amrohvi.*

22. Miscellaneous inscriptions, Kota, District Kota.— An epitaph from Kota contains first *Kalima* and bears A.H. 1072 (AD 1662) as the date of the death of a person (name not given). Another epitaph records the death in AH 1125 (AD 1713) of Rahman Khan son of Man Khan. An epigraph also from the same place assigns the construction of a lofty mosque in AH 1132 (AD 1719-20) to Hamid Khan of Man Khan. The epitaph from the same place states that Hasan 'Ali Khan Sahib, a resident of Lucknow who had gone to Ujjain with Karnal

Kalsan (Colonel Collins?) Sahib Bahadur died in AH 1271 (AD 1854) at kota on his return due to malarial fever after ailing for twenty days.

23. Inscription, Pirawa, District Jhalawar.— This inscription states that a well and a garden in Parawa (i.e. Pirawa) towards its West at Kotri Darwaza were constructed in A H (AD 1820-21) by Miyan Himmat Khan Bahadur at a cost of 25100 rupees and 5 annas.

24. Inscriptions, Ranthambhore, District Sawai Madhopur.— Among the two inscrip tions, the one contains first *Kalima* and a couplet and bears A.H.1073 (AD 1662-63). The purport is not mentioned. The second which is an epitaph, records the death of a person (name lost) in AH 1132 (AD 1719-20).

UTTAR PRADESH

25. Mughal inscription, Mahaban, District Mathura.—This epigraph records the constru-ction of a lofty tomb of Chandan Shahid in the twenty-second regnal year of Shah Alam II, A.H.1194 (AD 1780) by Agha Baqir under the supervision of Ghulam 'Ali Baig. It also mentions Naththu as the architect. The saint died in the same year according to an epitaph found at the same place.

26. Miscellaneous inscriptions, Mahaban, District Mathura.— Of the three epitaphs, one records the death of a Muhammad Warith in A H 1110 (AD 1698-99). According to another epitaph from the same place, Khuda Bakhsh of Qabchaq tribe and a resident.of Herat (in Afghanistan) died in AH 1195 (AD 1781). Another epitaph from the same place refers to the death in AH 1210 (AD 1796) of Sayyid 'Ashur' Ali. One more inscription from the same place records the construction of a mosque in AH 1238 (AD 1822-23) by one Sa'du'llah.

27. Mughal inscriptions, Chunar, District Mirzapur.— Three metrical records of Akbar executed in beautiful *Nastaliq* state that Muhammad Sharif Khan (Sharifu'd-Din Muhammad Khan) consctructed a lofty gateway facing west in AH 981 (AD 1373-74) for the benefit of the inhabitants as well as to repel the disturbances. The builder is referred to have been appointed as one of the *Khassa-i-Khailan* (Plate 79).

28. Miscellaneous inscriptions, Chunar, District Mirzapur.— This metrical epitaph records the death of a saintly person Qasim son of Qadim Afghani in AH 1016 (AD 1607-08). Its chronogram was composed by Lutfi. An inscription from the same place records the construc tion, of a building in AH 1038 (AD 1628-29) by Muhammad Wasit son of Shaikh Qasim. A bilingual epigraph also from the same place states that the fort along with the buildings within it were repaired in AH 1197 (AD 1783) at the instance of Nawwab Imadu,dDaula Waran Histanz (Warren Hastings) Bahadur Jaladat Jang under the supervision of Karnal Wilyam Balayar (Colonel William Blair) Bahadur Bahram-Jang.

NUMISMATICS AND TKESURE TROVE[1]

GUJARAT

1. Silver coins, Ahmedabad, District Admedabad.— Silver coins were discovered at Manbatta chawl of Asharva Itwada, Ahmedabad City.

2. Silver coins, Surat, District Surat.— 261 Silver coins were discovered while digging the foundation for a bridge. These coins were of 1688-1707 A.D.

3. Copper coins, Dharola, District Vadodara.—Sixteen copper coins of the Delhi Sultans, Ahmedshah and of the Baroda State were collected from the village Dharola.

HARYANA

4. Mughal coins, Mirzapur, District Kurukshetra.— One hundred and sixty silver coins belonging to Mughal rulers Akbar, Jahangir and Shahjahan were discovered in an earthen pot having a copper lid.

KARNATAKA

5. Coins, Godholi, District Belgaum.— Seventeen coins were found at Godholi village. Of these, fourteen small coins assignable to the Western Ganga Period having standing elephant with letters *ka* or *pa* in Kannada on the obverse and floral designs on the reverse. The remain ing three coins show a seated Hanuman with the legend *nakara* in Kannada below on the obverse and floral design on the reverse. They belong to Hangal Kadambas.

6. Coins and ornaments, Gouripura, District Bellary.— Eleven coins of the Vijayanagara King Krishnadevaraya and gold ornaments like umbrella, Kanasa, Chinktak, neck lockets, spring, hand chain pieces, ear-ornaments and snake were found.

7. Gold coins and Thalis, Yaradankalu, District Chikmagalur.— Two gold Thalis with embossed figures of Devi and 132 gold coins were found. The gold coins were Kanthirayi Phanams issued by the Mysore King Kanthirava Narasaraja Wodeyar.

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[1] Information from : 1-3, the western circle of the survey; 4, the North-western circle of the survey; 5-16, the Department of Archaeology and Museums, Government of Karnataka; 17-18, 20-22, Central Museum, Nagpur; 19, the South-western Circle of the Survey; 23, Government of Manipur and 24-29, the Department of Archaeology and Museums, Government of Rajasthan.

8. Gold coins, Kudregundi, District Chikmagalur.— Nine gold coins bearing caparisoned elephant on the obverse and floral design on the reverse were found. These coins were issued by the Western Ganga Kings.

9. Coins and ornaments, Kotekere, District Chitradurga.—Fifteen small gold coins and silver ornaments were found

10. Coins and ornaments, Peruvai, District Dakshina Kannada.— Twenty-eight silver coins were found. They bear the legend Tandy a Dhananjaya' in Nagari script on the reverse and a single fish under a canopy with conch and Chauri at flanks on the obverse. These coins were of king Pandya Dhananjaya, an Alupa King of the thirteenth century. Two bracelets, one tali, two bars-one ring like, ear ornaments and two wire ornaments, all made of gold were also found.

11. Coins and other antiquities, Palthady, District Dakshina Kannada.—Three gold coins, twenty-four silver coins and one lead rod were found. Three of these coins were having Arabic legends of the Mughal period. Eleven silver coins were having a fish under a canopy, flanked by a conch and a Chauri on the obverse, and the legend 'Pandya Dhananjaya' in Nagari script on the reverse. These coins belong to the Alupa King Pandya Dhananjaya, also known as Kundan ruling in the thirteenth century.

Thirteen silver coins bearing a fish under a canopy flanked by a conch and a Chauri on the obverse, and a single letter 'Si' (Sri), on the reverse were found. They belong to Alupa King Soyidevarasa.

12. Coins, Belagalapet, District Dharwad.—Six hundred and forty silver coins of one rupee denomination belonging to the Queen Victoria, the Kings Edward VII and George V were found.

13. Coins, Hangal, District Dharwad.— Out of the forty-five silver coins forty-four were of the British period and belong to the Queen Victoria and the King William while the remain ing one has an Arabic Inscription.

14. Coins, Hosahalli, District Kolar.— Three hundred and twenty-seven silver coins of the Queen Victoria and the King Edward VII were found near Hosahalli village.

15. Bronzes, Bethamangala, District Kolar.— Two Chola bronzes of the 12th century showing Bhairava and Devi were discovered near the Bethamangala village.

16. Coins, Abbigeri Tank, District Raichur.— Forty-one silver coins were found during the construction of the Abbigeri Tank. Thirty-nine of them were of one rupee denomination the two were of eight anna denomination. They belong to the period of the Queen Victoria and the King Edward VII.

MADHYA PRADESH

17. Coins, Mallar, District Bilaspur.- Two copper coins of the Satavahana kings Apilaka Chandasri coins of Magha kings Sivamagha and Yamagha were found at Mallar.

18. Hoard of Copper Coins, District Chhindwara.— A hoard of copper coins belonging to the Gond King Mokashah of the Devagadh house of the Gonds of Central India was found.

MAHARASHTRA

19. Coins, Chanda, District Chanda.— Sixty-eight silver coins of Mughal and two copper coins of the Holdar royal family were acquired.

20. Hoard of Indo-Sassanian Coins, District Nagpur.— About forty Indo-Sassanian debased silver coins from the vicinity of Nagpur were acquired.

21. Coins, Nagpur, District Nagpur.— Coins of Kanhamitra (Krishnamitra) and of Bhadra kings, who ruled over the Vidarbha region of Maharashtra- during the second and first century BC were acquired.

22. Coins, Paundar, District Wardha.— Copper coins of the Vakataka king Prithivishena and some other Vakataka kings were found.

MANIPUR

23. Coins, Imphal, District Imphal.— One thousand, seven hundred and forty-four bell-metal coins of the seventeenth-eighteenth century AD were recovered from the bed of the Manipur River at different localities.

RAJASTHAN

24. Coins, Siwana, District Barmer.— Three hundred and sixty-four Gadhiya coins were acquired from the village Siwana.

25. Coins, Bharatpur, District Bharatpur.— Three copper coins were acquired from the mound at Noh. One coin wan square shaped while the other two were round in shape.

26. Coins, Rampura, District Bhilwara.- Thirteen silver and ninety-six copper coins were acquired from village Rampura.

27. Coins, Bundi, District Bundi.- Sixteen silver coins belonging to Emperor Aurangzeb

were found at Bundi.

28. Coins, Ahar, District Udaipur.— Twenty-four copper coins were collected from an ancient mound at Ahar.

29. Coins, Kalyanpur, District Udaipur.— Four hundred and thirty copper coins from village Kalyanpur were acquired.

OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. Medieval structure, District Mahbubnagar.— S.V.P. Halakatti of the South-Eastern Circle of the Survey, during the course of his exploration, noticed the remains of a brick structure belonging to the Medieval period.

ASSAM

2. Terracotta Sculpures, Dahparbatia, District Sonitpur.— B.L. Nagarch of the North-Eastern Circle of the Survey discovered two terracotta sculptures at Mainalchuri Dahparbatia. One of the sculptures represented a dancing *Gana.* His belley, hands and head were chopped off. The sculpture was horizontally broken into two pieces. It measured 25 x 25 x 4.75 cm. The other sculpture was vertically broken and representing two male elephant-riders. Both the elephants which were standing back to back measured 25 x 30 x 4.75 cm. and were of the late Gupta period.

GOA, DAMAN AND DIU

3. Cave and Prehistoric sites, Goa.— A rock-cut cave belonging to the Chalukya period (*c.* AD 600) Pernem Taluk; a Kannada inscription on a new Pillory at Old Goa; a huge Shivlinga in Satari taluk; a megalithic site in Kakomoddi, Sanvordem and sixty Menhirs in Sao Jose de Areal were discovered by Directorate of Archives, Archaeology and Museums, Goa.

GUJARAT

4. Inscription, Jivapur, District Rajkot.- A Khshatrapa inscription was discovered by the Department of Archaeology, Government of Gujarat in Jivapar, Jasdan Taluk. The inscri ption is written in the Brahmi script and belongs to AD 311. The inscribed block of basalt measured 1.50 m in length and 0.57 m. in width. The inscription reads:-

(1) Va Se 233 Sravena bahule
(2) 6 Kumardev putrasya
(3) Ka (ku) mardattasya

5. Kashatrapa coin, Dharola, District Vadodara.- Narayana Vyas of the Western Circle

of the Survey collected a silver coin of Kashatrapa Vishvasena, son of Kashatrapa Bhadrada-man.

6. Fossil, Goraj, District Vadodara.— Narayan Vyas of the Western Circle of the Survey collected a fragmentary fossil of an animal from the section of the Deo river.

7. Stone Age Tools, Goraj, District Vadodara.— B.M. Pande, Narayan Vyas and K.V. Rao of the Western Circle of the Survey collected Early Stone Age tools along the Deo river in the vicinity of village Goraj.

8. Microliths and copper objects, Mahadeopura, District Vadodara.— Narayan Vyas and S. Sarangadharan of the Western Circle of the Survey noticed a site near Mahadeopura containing microliths and copper pieces in an agricultural field.

9. Medieval Temple and Sculptures, Nanjalpur, District Vadodara.— R.D. Singh, Narayan Vyas and N.A. Saiyed of the Western Circle of the Survey noticed a ruined Brahmanical temple and sculptures representing Siva, Ganesa, Vishnu, apsaras, etc. in the vicinity of the village.

HARYANA

10. Kushana Structures, Nabu Bas, District Gurgaon.— B.S. Negi of the Delhi Circle of the Survey discovered an extensive mound which yielded black-and-red ware, P.G.W., Black silpped ware and Kushana structures.

JAMMU AND KASHMIR

11. Pebble Tool, Phalgam, District Anantnag.— B.K. Sinha of the North-western Circle of the Survey picked up a pebble tool from the terrace formed at the liddar-valley near Pahlgam.

12. Silver Coins, Zoomrish, District Kupwara.— B.K. Sinha of the North-western Circle of the Survey reported a hoard of ninety-nine silver coins of a Mughal and Durrani rulers, found during the construction of a road by P.W.D. workers.

13. Ancient Site, Tukroo Tengwani, District Pulwama.— D.R. Gehlot and S.N. Jaiswal of the North-western Circle of the Survey, discovered an ancient habitation site at village Tukroo Tengwani in Shopian tehsil. The site, yielded pottery ranging from the Kushan to Muslim period. The deposit was approximately 3 metres.

14. Sculpture, Badshah, District Srinagar.— R.S. Bisht and G.S. Gaur of the North-wes-

tern Circle of the Survey discovered a head perhaps of Siva, during the process of levelling the ground of the Badshah tomb. It appears to be post-Gupta in date. (Pl. 80).

KARNATAKA

15. Stone Age Sites, Badami, District Bijapur.—. V. Padigar of the Museums Branch of the Survey, Badami, discovered Lower Palaeolithic, Middle Palaeolithic and Mesolithic sites in the northern precincts of Badami. The Mesolithic tools were usually found in rock shelters and hill top plains. Paintings were also observed in the rock-shelters. In certain rock-shelters and caves indistinct paintings were also noticed and these may belong, to the Mesolithic people who inhabited in these shelters, as indicated by the availability of microliths.

MADHYA PRADESH

16. Stone Seal, Malhar, District Bilaspur.— A stone, seal of hematite was collected by M.U.M. Rao of the Central Circle. The seal has a Brahmi inscription assignable to seventh-eighth century AD and has a small four petal floral design below the inscription separated by two lines. The inscription reads "Padma Nabhasa" meaning Padmanabhasya. (Pl. 81).

17. Siva Temple, Sarda, District Durg.— S.S. Yadava of Department of Archaeology and Museums, Raipur, discovered a Siva temple of sixth century AD at Sarda. Its door-jamb contained sculptures of Uma-Mahaesvara, Arddha-narisvara, Gajahari and the river goddess Yamuna.

18. Palaeolithic Sites, Bhagawanpura, District Mandsaur.— R.K. Pancholi of the Directorate of Archaeology and Museums, Bhopal, discovered Palaeolithic sites, in Bhanpura Tehsil. Two sites, yielded Upper Palaeolithic tools made on flakes of chalcedony, chert and Jasper.

19. Stone Age Tools, District Raisen.- C. Krishna, O.P. Misra and R.R. Singh of the Directorate of Archaeology and Museums, Bhopal to Madhya Pradesh, discovered several Palaeolithic tools from the surrounding hills of Mandideep and Pipaliya Lorka. The tools were made on sandstone.

20. Sculptures, District Rajanandgaon.— During the course of exploration of Ambagarh Chowki, S.S. Yadav of Department of Archaeology and Museums, Madhya Pradesh, surveyed thirty villages. Of these the village named 'Narratola' has revealed 250 stone sculptures belong ing to the Gond period.

21. Sculptures, District Sehore.- C. Krishna and R.R. Singh of the Directorate of Archaeology and Museums, Bhopal, noticed Medieval Jain sculptures from Bhoora village and sculptures belonging to the Hindu pantheon, dated to *circa* eighth century AD.

22. Temple and Rock-shelters, District Vidisha.— O.P. Misra, N.K. Maheswari and Vinod Joshi of the Directorate of Archaeology and Museums, Bhopal, M.P. discovered a Durga temple on the top of a hill at Ahamadpur. It had a square sanctum of Paramara period. The important sculptures were Mahishasurmardini, Ganesha, Uma-Maheswara, Chamunda, and other Hindu sculptures lying around the temple and inside the sanctum.

At the same site paintings were also noticed in thirty rock-shelters of the Mesolithic to Historical periods. The colours used in the shelters were ochre, red, green, black and white. Two inscriptions of the Mauryan period were also noticed at the Ahmadpur rock-shelter.

MAHARASHTRA

23. Sculptures, Bemli, District Osmanabad.— D.M. Kulkarni of the South-western Circle of the Survey, noticed sculptures of Brahma, Uma-Maheswar, Astadikpalas and other architectural units of the later Chalukyan period.

MANIPUR

24. Neolithic Celt, Machi, District Chandel.— Rupoban Singh of the Manipur State Archaeology, found a neolithic celt.

PUNJAB

25. Sculpture, Ghanauli, District Ropar.— A unique sculpture of Uma-Maheshavara about 127 x 70 cms in height was discovered from a tank at village Ghanauli. The sculpture represented Uma-Maheshvara seated on Nandi and can be stylistically dated to c. tenth-eleventh century A.D. It was made out of greyish sandstone (Pl. 82).

RAJASTHAN

26. Temple and Sculptures, Bhoikhora, District Chittorgarh.— Narayan Vyas of the Western Circle of the Survey noticed on an early medieval Brahmanical temple and sculptures representing Nandi, Siva-linga, Ganesa and Surya.

27. Prehistoric site, Chhabra, District Kota.— Narayan Vyas and K.V. Rao of the West ern Circle of the Survey discovered a prehistoric site containing Stone Age tools.

28. Prehistoric Site and a Temple, Gugor, District Kota.— Narayan Vyas and K.V. Rao of the Western Circle of the Survey noticed a Brahmanical temple and sculptures on the bank of the river Parvati belonging to *circa* nineteenth century A.D. They also discovered a pre historic site containing Stone Age tools on the bank of the river Parvati.

29. Palace, Awa, District Pali.— R. Pathak of the Western Circle of the Survey noticed a palace with carved *jali* work, built by the Maharaja of Awa. It belonged to *circa* eighteenth century.

30. Step-wells, Bagrinagar, Banta and Baragudha, District Pali.— R. Pathak of the Western Circle of the Survey discovered five step-wells dateable between *circa* seventeenth-eighteenth century AD in Bagrinagar; two step-wells are ascribable to *circa* seventeenth century in Banta and a step-well in the vicinity of the village baragudha belonging to *circa* seventeenth century.

31. Medieval sculpture, Bhinwalia, District Pali.- R. Pathak of the Western Circle of the Survey noticed an image of Mahisasuramardini belonging to the medieval period.

32. Palace and Paintings, Chandawalanagar, District Pali.— R. Pathak of the Western Circle of the Survey noticed a palace built by Maharaja of Chandawalnagar having beautiful *jali* work and floral designs, belonging to seventeenth-eighteenth century A.D. He also noticed paintings on the ceiling and on the walls of shishmahal of the palace. The paintings depicted scenes of krishna-lila, Gangor-mela, Holi, hunting and riding scenes, musicians, Ganesa-puja, etc., assignable to c. eighteenth-nineteenth century.

TAMIL NADU

33. Megalithic Burials, District South Arcot.— The afforestation operations in the International Zone by the Aurovillians yielded vestiges of Megalithic burials. The Southern Circle of the Survey noticed urn-burials, cairn circle and burials capped by massive capstones with or without a cairn circle at Auroville.

UTTAR PRADESH

34. Medieval Temple and Stone Sculptures, District Chamoli.— L.M. Wahal of the Northern Circle of the Survey noticed a group of three temples of the *Sikhara* style with parasol at the top in the hilly area at Bhanej, dedicated to Siva, Bhagwati and Kaushaleya. Besides temples, he also located sculptures of Vishnu, Anantashayi Vishnu, Lakshmi-Narayana, Garuda, Mahisasuramardani, Surya, Uma-Mahesvara, Ganesa, Durga, Surasundari, Siva Iinga with Yoni-patta and the architectural members.

35. Medieval Temple and Sculptures Shaileshwar, District Chamoli.— The Shaileshwar temple is situated in the village Shaileshwar Patti Talk Chandpur. A few early medieval sculp tures were found in the compound, such as an image of Sahasralinga, Shiva Parvati, Vakrat-unda Ganesh and Devi. The images were of tenth to thirteenth century A.D.

36. Medieval Sculptures, District Dehra Dun.- L.M. Wahal of the Northern Circle of the

Survey noticed a defaced *Panchayatana* Siva Linga and other architectural members at Bid-hauli.

37. Paintings in the Temple, District Dehra **Dun.—** L.M. Wahal of the Northern Circle of the Survey noticed a Siva temple of old Kalsi, bearing paintings belonging to the early nine teenth century. On close inspection, it was noticed that surface of interior walls ceilings of the temple and portico have paintings. The paintings depicted Puranic themes.

38. Stone Sculptures, District Farrukhabad.— L.M. Wahal of the Northern Circle of the Survey noticed a few stone sculptures of the late Medieval period at village Parma Nagar representing the dancing Ganesa, Hanumana and architectural members. A coin (fulus) of Akbar, dated AH 1000 (AD 1592) was also collected from the site.

39. Pottery, District Farrukhabad.— J.P. Malhotra of the Northern Circle of the Survey discovered an extensive mound at Qaimganj, which yielded pottery consisting of sherds of fine grey ware and a straight-sided bowl of red ware.

40. Temple Complex, District Garhwal.— Under the guidance of V.K. Tewari and P.K. singh the Survey undertook the exploration work and discovered a temple-complex of c. tenth-eleventh century AD at village Deval, Patti Sitonsyun, P.O. Kot, Tehsil Pauri. There were altogether eighteen temples of different sizes and styles but-only twelve have survived. A large number of sculptures were housed in the temple.

41. Brahmi Inscription, Dhara Road, District Garhwal.— An inscription on a stone slab in a nullah (water gutting place) was located in the main market of Dhara Road in the Pauri town by the U.P. State Archaeological Organisation. It consisted of four lines carved on a stoneslab measuring 67 x 18 cms. The letters were angular in character.

42. Medieval Sculptures, District Jalaun.— L.M. Wahal of the Northern Circle of the Survey noticed some stone sculptures at Konch representing Narasimha, Siva-Parvati, Vishnu, Navagraha, Matrika panel and several other architectural members.

43. **Medieval Stupa, District Kanpur.—** L.M. Wahal of the Survey located remains of a stupa at village Chan war.

44. **Metal Images, Kazipur, District Saharanpur.— D.P.** Thapliyal and C.P. Singh of the Northern Circle of the Survey, collected three metal images found at Kazipur from the police station of Sarsava. They were of Surya, Vishnu and Kalyanasundara Siva, assignable to the Medieval period. (Pls.. 83 & 84).

45. **Medieval** Site, **Neotini,** District **Unnao.—** J.P. Malhotra and C.P. Singh of the North-

ern Circle of the Survey located a mound at Neotini which yielded sherds of black slipped ware, red ware and glazed ware of the medieval period.

WEST BENGAL

46. Miniature Votive, Kotalpur, District Bandura.— A.K. Karmkar of the Directorate of Archaeology, Government of West Bengal collected a miniature votive shrine of stone, dated to *circa* tenth century A.D. (Pl. 85).

47. Sculpture, Bataspur, District Burdwan.— R.K. Sen of the Directorate of Archaeology Government of West Bengal, collected a stone sculpture of eight-armed — Dhata which can be dated to *circa* eleventh century A.D.

48. Medieval Site, Sculpture, Reigram, District Burdwan.— B. Bandyopadhyay of the Eastern Circle of the Survey located a medieval site yielding ornamental stone pillars, pillar bases, grey and red ware and a sculpture of the Varaha Avatara of Vishnu.

49. Medieval Sculpture, Gaur, District Malda.— A.K. Bandyopadhyay of the Eastern Circle of the Survey located a curious female head in stone, dateable to *circa* eleventh-twelfth century A.D.

50. Sculpture, Sagardighi, District Murshidabad.— R.K. Sen of the Directorate of Archaeology, Government of West Bengal collected a mutilated stone sculpture of the goddess Marichi, ascribable to *circa* eleventh century A.D. (Pl.. 86).

RADIOCARBON DATES[1]

KERALA

A wood charcoal sample obtained along with the Mesolithic artifacts from Tenmalai rock-shelter has been dated by Carbon-14 method, in the Birbal Sahni Institute of Palaeobotany, Lucknow to 5120 ±120 years BP (BS-525). This is the first C-14 date for a Mesolithic site in Kerala. Tenmalai rock-shelter also has carvings which could be of the same period.

The date is based on radiocarbon half-life value of 5730 ± 40 years for their conversion into BC scale, the year 1950 is to be taken as the base.

[1] Information supplied by Dr. P. Rajendran of the Deccan College post-graduate and Research Institute, Pune.

PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The present report incorporates the work done at the Birbal Sahni Institute of Palaeo-botany, Lucknow.

The charcoal samples were supplied by the Archaeological Survey of India; wood charcoals from Sringverapura, District Allahabad, U.P. by the Indian Institute of Advanced Study, Simla and The Archaeological Survey of India, New Delhi. Ancient food grains from Maho-rana, District Sangrur, Punjab, by Punjab University, Chandigarh; and materials from Rohira, District Sangrur by Punjab State Archaeology Department.

The biogeographical and ethnobiological inferences for the wood charcoals from various archaeological sites, the identification of which was reported earlier (1982-83, P. 146) are based upon a modern data base, as given here. In addition to some new reports on ancient food economy, further investigations have been carried out to build up the diffusionary trends of cultivating rice in northern India. To categorise the different shapes of rice kernels, statistical analysis of the paddy impressions on potsherds, has also been made.

The soil samples from pre-Harappan and Harappan trenches at Rohira, District Sangrur, Punjab, were found devoid of pollen grains. Remains of food grains and other seeds, however, were recovered from some of the soil samples of pre-Harappan occupation as reported here.

ANDHRA PRADESH

1. Ramapuram, District Kurnool.— Biogeographical and Ethnobiological investigations of the significance of the ancient woods of *Hardwickia binata* and *Grading arborea* already reported from this chalcolithic site (1982-83 p. 146) reveal that the timber of *H. binata* was locally available, whereas that of *G. arborea* was possibly imported from Nallamali hills, the nearest possible source of this timber about 70 km east of the site. The extremely hard wood of *H. binata* was used for cart wheels, ploughshares and other agricultural implements. The timber of *Gmelina arborea* was used for boats, drums, etc. Possibly its fruits were also eaten.

2. Veerapuram, District Kurnool.- *Acacia* reported from this megalithic site (1982-83, P. 146) was a locally available timber as it grows at present also in the *Hardwickia Anogeissus*

[1]Contributed by Dr. Vishnu Mittre, K.S. Saraswat, Aruna Sharma and Chanchala of the Birbal Sahni Institute of Palaeobotany, Lucknow.

series in this area. The wood was possibly used for agricultural implements and also the bark for tanning.

BIHAR

3. Rajgir, District Patna.— *Madhuca longifolia* var. latifolia associated with N.B.P. Ware Culture at this site (1982-83, P. 146) was a common local tree. The wood was used-in house building, for furniture, country vessels, etc. Its flowers were possibly used for the distillation of spirit. The outer coat of the fruit was also eaten, and the oil extracted from the seeds, possibly used for cooping and burning.

GUJARAT

4. Nagara, District Kaira.— The wood of *Adina cordifolia* already reported in association of Black and Red Ware Culture from this site (1982-83, P. 146) was imported from moist-deciduous forests in southern Gujarat. The moderately hard wood was employed in construc tion for agricultural implements and for numerous other purposes.

5. Surkotada, District Kutch.- The wild seeds reported earlier (1982-83, P. 146) are identified as of *Cyperus irica, Trianthema pentandra, Carex spicate, Trifolium repens, Euphorbia pycnostegia* and .of wild grasses viz., *phragmites Karka* and species of *Poa, Andropogon, Brachiaria, Panicum, Echinochloa, Eragrostis* and *Digitaria.*

In context of highly advanced Harappan culture at this site, it seems reasonable from evidence of wild seeds to believe that the Harappans were food-gatherers also. The wild seeds might have been used for some specific purposes e.g. medicinal or to feed the birds. The botanical finds are very interesting but their significance is enigmatic.

HARYANA

6. Singh-Bhagwantpur, District Kurukshetra.— *Acacia* and *Bamboo* reported earlier from this early historic site (1982-83, PP. 146-147) were available locally in the area. Bamboo was used in house construction and as posts whereas timber of *Acacia* was used for agricultural implements, fuel, etc. The leaves and pods of *Acacia* were, possibly, used to feed the domesticated sheeps and goats.

JAMMU AND KASHMIR

7. Gufkral, District Pulwama.- The specific identity of wood charcoals tentatively reported earlier (1982-83, P. 147) has been confirmed as follows:

a) BS-360 & 371 (Late Neolithic): *Picea smithana* and *Pinus wallichiana*

b) BS-37Q (Late Neolithic): *Buxus wallichiana, Pinus wallichiana* and *Ulmus wallichiana*
c) BS-356 (Late Neolithic): *Pinus wallichiana*
d) BS-357 (Early Neolithic): *Prunus cornuta* and *Aesculus indica*
e) BS-359 (Early Neolithic): *Juglans regia*
f) BS-358 (Aceramic Neolithic): *Pinus wallichiana*

In the stratigraphical context, the wood remains suggest the use of new kinds of timbers to meet their requirements and their capacity to look for more useful plants. Most of the timbers were available in Kashmir itself. The distribution of *Buxus* is not easy to understand as it does not seem to depend upon any definite climate, soil and surrounding vegetation. *Buxus* was available south of Pir Panjal in Jammu State and is as available now also. Possibly, the Guf-kralians might have obtained *Buxus* wood through their socio-cultural contacts with cultures inhabiting the south of Pir Panjal.

MADHYA PRADESH

8. Besnagar, District Vidisha.— The durable timber of *Acacia* reported from this historical site (1982-83, P.148) was a locally available timber and used for agricultural implements, tool handles, etc. The bark and pods were, possibly, used in tanning and the gum used in local medicines and other useful products.

9. Kayatha, District Ujjain.— *Acacia* and *Cassia* fistula of which wood remains have already been reported from this chalcolithic site (1982-83, P.148) were locally available in the *Teak-Anogeissus* forest around the site.

MAHARASHTRA

10. Diamabad, District Ahmednagar. The specific identifications of charcoals already reported (1982-83, P. 148) have been confirmed and some more charcoals have also been investigated and identified as follows:

a) DMD/52/1977-78 (Jorwe Culture): *Ziziphus mauritiana and Acacia sp.*
b) DMD/46/1977-78 (Jorwe Culture) : *Pterocarpus marsumpium* and *Trema orientalis*
c) DMD/30/1977-78 (Malwa Culture) : *Acacia* sp., *Dalbergia* sp., *Dalbergia* sp., Anogeissus *latifolia* and *Cassia fistula*
d) DMD639 1977-78 (Buff and Cream Ware) : *Acacia* sp., and *Anogeissus* sp.
e) DMD/53/1978-79 (Late Harappan) : *Boswellia serrata*
f) DMD/41/1977-78 (Savalda Culture) : *Acacia* sp.

The investigation reveals the progressive and diverse use of various kinds of timbers. The timbers of *Ziziphus mauritiana, Cassia fitula* and *Acacia* were locally available. The timbers of

Anogeissus latifolia and *Doswellia serrata* were imported from dry deciduous forests about 100 km south of the site and that of the *Dalbergia* from the moist-deciduous foresta at the distance of about 300 km in the west. The other constituents of moist deciduous forests were the light timber of *Trema orientalis* and the heavy and quality timber of *Pterocarpus marsupium.* The latter is highly esteemed for posts and beams, agricultural implements and cart and boat-making.

11. Sonegaon, District Pune.— Out of the timbers *of Acacia* and *Tectona grandis* (Teak) reported earlier (1982-83, P.148), the former was locally available whereas that of teak was imported from the forests about 60 km from the site in the eastern and south-eastern directions. Teak is admirably suited for the best class of house carpentry and for all purposes of house-building, and its exploitation by the ancient settlers is to be reckoned with.

PUNJAB

12. Mahorana, District Sangrur.— The carbonised food grains (Pl. 87) from the trench MRN, 42 UX-41. stratum B, period IB dating from c. 2100-1900 B.C., have been referred to hulled and nakes six-row barley *(Hordeum vulgare* L. & *H. vulgare* L.var. *nudum), dwarf wheat (Triticum sphaerococcum* perc), club wheat *(T. Compactum* Host.) and lentil *(Lens culinaris* Maedik). Grape pips *(Vitis vinifera* L.) have also been identified in the collection. Among the food grains already known from Indus civilization, the discovery of grape pips in the Harappan context at this site and a Rohira (account below), is a new archaeobotanical record for the Indian-subcontinent.

13. Rohira, District Sangrur.— In continuation to the analysis of Harappan food economy from period IB (1982-83, p. 148) some food grains were recovered by floatation technique from the soil samples of archaeological trenches RHR, C-8, Layer-8; RHR, F-7, Layer-7, and RHR, F-10, layers 10 and 12, referred by the excavator to the pre-Harappan occupation (period IA) dating back from C. 2300 to 2000 BC (PI. 88). The finds of barley *Hordeum vulgare* L.), dwarf wheat (T. *sphaerococcum),* emmer wheat *(T. dicoccum),* lentil *(Lens culinaris)* and Horsegram *(Dolichos biflorus)* are the same as reported earlier from period IB. Jowar-millet *(Sorghum vulgare* L.). a grape pip *(Vitis vinifera* L.) and an uncarbonised stone of date palm *(Phoenix* sp.), are however, additional evidences in pre-Harappan food economy at this site.

UTTAR PRADESH

14. Baraunha, District Mirzapur.— 23 potsherds from 2 samples exhibited the dominance of a slender type of grain impressions from this Neolithic site.

15. Hulas, District Saharanpur.— A single potsherd from this late Harappan site

(1979-80, P.114, 1982-83, P.149) after breaking open along its thickness, exposed the impressions of slender and round paddy grains. The round grain impressions, however, dominate in this sample.

16. Koldihwa, District Allahabad.— The scan-microscopy of rice husk impressions on the potsherds from this Neolithic site, has confirmed the identification of both wild and cultivated strains of rice *(Oryza fufipogon* and *O.sativa).*

17. Lekhahia, District Mirzapur.— The specific identification of charcoals reported earlier from this Mesolithic site (1982-83, P. 149) has further been checked and confirmed as follows:

a) TF-340 : *Anogeissus pendula* and *Lagerstroemia speciosa.*
b) TF-341 : *Callicarpa arborea*

Anogeissus pendula was a local tree whereas the timbers of *Lagerstroemia speciosa* and *Callicarpa arborea* were possibly obtained from the forests of Pilibhit, Gonda and Gorakhpur regions in northern U.P. Callicarpa is, however, restricted to the Gorakhpur district at present.

18. Mahagara, District Allahabad.— The potsherds from 8 samples, showed the domi nance of slender type of paddy grain impressions, though a few round types were also noticed.

19. Manigara, District Mirzapur.— Out of 11 potsherds examined only 4 showed the dominance of slender paddy grain impressions. The round grain impressions were rather limited.

20. Sohgaura, District Gorakhpur.— On examination under binocular microscope, only 3 potsherds out of 92 samples revealed the majority of slender rice grain impressions.

21. Sringaverapura, District Allahabad.— More than a dozen of wood charcoals and semi-carbonised wooden fragments from trench SVP-1, YA3-Qd.3, Layer 19E of period I dating from C. 1050 to 1000 BC, have been studied and identified as of Mango *(Mangifera indica),* Mahua *(Madhuca longifolia),* Jujube *(Ziziphus jujuba), Acacia* sp., *Pinus* sp. and Bamboo. The Pinus wood was imported from the Himalayan hills and the rest of the timbers were available locally from the surrounding forests.

22. UN, District Saharanpur.— Round paddy impressions are more common on a pottery piece examined from this late Harappan site.

MUSEUMS

1. Tripura Government Museum, Agartala.— A metal plaque measuring 28 x 22 cm was acquired during year under review.

2. Government Museum, Ahar.— Twenty-four coins, several Protohistoric antiquities and one stone sculpture were added to the collection. Every care was taken to present a better display of museum exhibits.

3. Government Museum, Ajmer.— Ten stone sculptures belonging to a different period were acquired for the museum.

4. Government Museum, Alwar.— The painting section of the museum was improved by adding one new show-case which was designed for the display of illustrated manuscripts. Barah-Masa Paintings of the Alwar school were specially displayed in the museum. The exhibits were cleaned and reclassified on scientific lines and properly labelled.

5. Archaeological Museum, Amaravati.— The Museum acquired five architectural pieces from Vaddamanu village, Guntur District, Andhra Pradesh of which one bears inscription in Brahmi character.

6. Government Museum, Amber.— Three carved stone figures were acquired for the museum. These sculptures belong to eighteenth-nineteenth century A.D.

7. Archaeological Museum, Badami.— The museum collected two copper coins and few stone tools from Badami. Out of two coins one belongs to the Vijayanagara period (1543-1565 AD) and another bears a Persian legend.

8.. Government Museum, Bangalore.— Four hero-stones were acquired by the Government Museum, Bangalore. Seven coins, a sword, a handmade muzzle loading pistol were acquired by the Government Museum Hassan. Nineteen iron balls were acquired by the Government Museum, Shimoga., and one canon was acquired for the Head Office from the Sub-Inspector of police, Hukkeri, Belgaum District.

9. Government Museum, Bharatpur.— A sandstone sculpture bearing two human figures was found from Noh. The other specimen depicting a lady figure in sitting posture was collected from Deeg. Both were of the eighth century AD.

10. Site Museum, Bhishmaknagar.— A site museum at Bhishmaknagar, Arunachal Pradesh has been constructed. This museum will display excavation materials of Bhishmak-nagar as well as from its neighbourhood areas. An archaeological site museum is also coming up at Malinithan.

11. Prince of Wales Museum, Bombay.— Twenty-four objects acquired by the museum were made of sandstone (1), paper (1), ivory (2), silk (5) and of cloth(15).

12. Indian Museum, Calcutta.— A stone sculpture of Surya standing in *samapadastha-naka* belonging to the ninth-tenth century AD acquired at Anantapur village during an excava tion of a tank. The Sculpture (34" x 8") is made of Khondalite stone.

Sixteen coins in gold, silver and copper, belonging to different periods were acquired. Among these three silver pieces, found by a fisherman at Kakdwip in the 24 Parganas and rec-eived through a Bank Officer, represent different numismatic issues of Ahmad Shah of the Bahamni kingdom and Alauddin Hussain Shah of Bengal. The gold coins acquired are one of Akbar and the other a post-Gupta issue,.Besides, coins of Sikandar Shah, Ilyas Shah and of the kings of Coochbihar, were also acquired.

One copper-plate inscription inscribed in the Nagari script and written in Sanskrit language, dateable to eleventh-twelfth century AD was also acquired by the Museum.

Re-organisation work in the Gandhara, Mathura, Minor antiquities, Pre-history and Coin galleries was undertaken.

A major conservation project was undertaken by the Museum's Preservation Unit for chemical cleaning and restoration of the Bharhut gateway and railings. The flaking of certain pillars and salt action in some of the architectural parts were consolidated and conserved.

Twelve antiquities consisting of stone sculptures and bronze objects were sent to Japan and U.S.A. for temporary exhibition.

13. Bhuri Singh Museum, Chamba.— A new and spacious building for the Bhuri Singh Museum, Chamba, was completed and the setting-up of the galleries is in progress.

An all India Seminar on History and Culture of Chamba was organised from 26th September, 1984 and several scholars from various Universities, research institutions and organizations participated. A small publication including information on the history and art of Chamba was brought out during the seminar.

14. Government Museum, Chittorgarh.— New show-cases were added to the Museum. Provision of emergency lights was made. One bronze and a stone sculpture of Jain Tirtha-nkar were added to the museum collection.

15. Government Museum, **Dungarpur.—** One standing Surya sculpture, carved in white stone belonging to tenth and eleventh century AD was added to the collection.

16. Assam State Museum, Gauhati.— The following were the important acquisitions: five stone images of eighth-ninth century AD from Jorhat district, two icons made of basalt and two bronzes of the tenth century AD from Mongaldoi district, two beautiful stone images of sixth-seventh century AD from Dibrugarh district (Plates 89 & 90), a huge image of Ganesha from Gauhati district, 4 doorframes dateable to the tenth century i.e. from Goalpara district and a few beautiful wooden sculpture from Barpet district. The museum organised four temporary exhibitions and one Seminar on "The Necessity of Preservation of Nature and Cultural Heritage of Assam". It has also opened a new section on ethnography.

17. Goa Museum, Goa.— The Museum has acquired an old carved triangular wooden chair of the last century, broken pieces of stone sculptures and a beautiful *Sati* Stone belong ing to fifteenth-sixteenth century AD. The Museum celebrated its seventh anniversary on 29th September 1983. It also organised the Museum Week in January 1984 and a special lecture by Dr. N.P. Joshi. Some replicas were prepared and sent for exhibition in the Goa Pavilion, at the International Trade Fair, New Delhi.

18. Archaeological Museum, Hampi.— A black stone head of a life-size royal figure and a small chart showing the distribution of various mint towns under Vijayanagara period were exhibited in Gallery No. 2 of the museum.

19. Government Museum, Hawamahal, **Jaipur.—** In order to project regional culture of Jaipur area, the ancient Dhundhar Desn, a new museum at Hawa Mahal, Jaipur, was established. The museum consists of seven galleries.

20. Government Museum, Jaisalmer.— A new museum was organised and inaugurated at Jaisalmer. The various galleries constitute of Geological specimens, Pre-historic antiquities, coins, sculptures,-epigraphs and objects of local art and crafts.

21. Government Museum, Jhalawar.— New pedestals were provided for selected sculptures of the museum.

22. Government Museum, Jhansi.— The museum acquired some sculptures and frag mentary pieces from Lalitpur, dated to *circa* tenth century AD.

A life-size image of Hanuman is also an acquisition of the same place. He is shown *Vitarkamudra.*

An illustrated manuscript combining seven small books has been acquired from a local dealer. It includes the text of Srimad Bhagavata Gita, Bhimastvaraja, Anusmrati, Vishnu sahas-ranama, Gajendra moksha, Mahimana stotra and Soudarya Lahari,. It has sixteen illustrations

of about the mid-nineteenth century AD.

23. Government Museum, Jodhpur.— Twenty objects, including nine Gupta terracottas, two sculptures and nine bronzes of the Medieval period were acquired.

24. Archaeological Museum, Kalibangan.— The museum acquired 150 Harappan anti quities from the surface of the mounds at Kalibangan of which the most outstanding was a steatite seal (3.7 x 3.2 x 2 cm.) bearing Harappan script and a charging bull.

25. Government Museum, Kota.— Lighting arrangements in the museum were considerably improved. Besides, special safety measures were adapted and necessary repairing of the building was done.

26. Archaeological Museum, Lothal.— The museum is now completely organised on modern lines with charts, maps, etc. A model of the excavated site and a fibre glass model of the double burial is displayed in the museum.

27. State Museum, Lucknow.— Two galleries of Archaeology were set up. Antiquities from Pre-historic times to the Kushana period were exhibited. On the occasion of inauguration a book on the 'Buddhist Art of Mathura" was released.
The Museum acquired 30 objects including Sculptures, terracottas, Coins etc. (P1.91). Under the Education Extension Programme the museum organised the following exhibitions in the museum premises and also outside.

1. Exhibiton on Performing Arts was arranged in the Museum.
2. Exhibition on Islamic Culture was displayed in the museum.
3. In the Lucknow festival an exhibition was arranged. The antiquities concerning the history of Faizabad were put on show.
4. At Rai-Bareilly an Exhibition on "Ram in Indian Art'" was arranged in March, 1984.

The Museum Director and other colleagues delivered several lectures in the museum and in educational institutions of Lucknow and outside. Similarly the lectures on archaeological topics by the distinguished scholars were arranged in the Museum.

28. Fort Museum, Madras.— The major repairs to the terrace of the museum building were completed and portrait paintings were redisplayed in Gallery No. V. The walls and ceilings of galleries I to IV, Verandah and the passage were painted. Physical verification of all the antiquities of the Museum was done.

29. Government Museum, Madras.— A number of metal objects including the images of the crawling Krishna, Yashoda-Krishna, Durga, Kali, Ayyanar Ganesa, Rama, Venugopala,

Rukmini, Satyabhama and a brass vessel and broken bell were acquired. An exhibition "Choice Bronze — an exhibition" was arranged.

30. Government Museum, Mathura.— This museum was earlier known as the Archaeological Museum and Curzon Museum of Archaeology.

Collection.— During the year under review seventy-one objects were accessioned including two gold coins, thirty-four sculptures, one fragmentary inscription, sixteen terracottas, one Pre-historic implement and one farshi.

Other activities.— The Museum organised a lecture series i.e. Fourth Growse Memorial Lectures in March 1984. Dr Gritli Ven Mitter Wallner, Professor of Indology in the Munich University (West Germany) delivered two illustrated lectures on the 'Kushana Art of Mathura' and 'Coins of Kushanas'. A Temporary exhibition entitled 'Kushana Kala Men Nari' was arranged on the occasion in which the selected pieces of sculptures and terracottas were displayed from the reserve collection. Kushan Gold coins were also kept on show. To expand the Museum, programmes were organised in various institutions in which lectures were delivered by the museum staff incorporated with projection of documentary films on Art and History, plaster cast display and distribution of literature.

3.1. The Central Museum, Nagpur —The sculptures in the museum were provided with wooden pedestals. The Mohenjodaro gallery was re-arranged and a diaroma was made. The Museum participated in the xcavations Bhagimaheri, Tahsil Saoner, District Nagpur in collaboration with the Deccan College Post Graduate and Research Institute, Pune. The Museum sent few sculptures and bronzes for an exhibition which was arranged by the Prince of Wales Museum Bombay in January 1984. The Museum collected about twenty fragmentary sculptures of Vakataka period from around Nagpur. The Laboratory of the Museum did chemical cleaning of coins, bronzes and other objects.

32. Archaeological Museum, Department of Ancient Indian History, Culture and Archaeology, Nagpur University, Nagpur.—

Arrangements: The Vakataka Gallery was reorganised with the display of plaster casts and photographs of Vakataka sculptures and monuments in addition to antiquities. Seminar on "The Age of the Vakatakas" was also organised by the Department on January 29-31, 1984. An Inscription Gallery is being planned in the front corridor of the building where some inscriptions have already been displayed.

33. National Museum, New Delhi.— Thirteen bronzes, seven stone sculptures and three terracottas were obtained. Noteworthy bronzes are: Bodhisattva Padmapani, Manjusri ninth century, Eastern India; Tirthankar Parsvanath, Mahavir, thirteenth century, Western India and Ganesh, tenth-eleventh century Karnataka. Of the new acquisitions the following stone sculptures deserve special mention: two Kushana sculptures representing Hariti and Prasad-

hika dated to the second century from Mathura region, and a Surya image dated to eighth-ninth century, Kannauj. The most outstanding piece is a bronze wine cup ornamented with a Bacchanalian scene dateable to fifth-sixth century.

A temporary exhibition entitled 'Masterpieces of South Indian Bronzes' was held at the National Museum in the year 1983, of which a detailed catalogue was also published.

34. Patna Museum, Patna.— One Tibetan Thanka Painting on cloth showing the Buddha in *Bhumisparsa mudra* in the centre surrounded by several miniature figures of the Buddha in various poses and two Buddhist Bhikshus in a standing pose (size 108 x 65 cm), were acquired.

35. Archaeological Museum, Sarnath.— A Photographic Exhibition on 'Indian Sculpture' belonging to the fourth-seventh century AD was organised to have a comparative study with the sculptures of Sarnath. Close Circuit TV has been installed to provide recorded lectures to the visitors.

36. Government Museum, Ram Van, Satna.— The Madhawgarh fort is being protected by the museum and five silver coins of the mughal period were acquired by the museum.

37. Himachal State Museum, Simla.— The museum acquired 255 objects through purchase, exploration and transfer during the year under review.

Out of the sculptures added to the museum collection, the following deserve notice:—

Gargoyle with a figure of Gana of the late Gupta period.

Eleven sculptures, architectural pieces of the late medieval period and,

Seven bronzes were acquired.

One fragment of stone sculpture in typical Pratihar style stone-carvings of the post-Gupta period, six wooden carvings of the Surya and other deities in Gupta style were discovered and registered.

38. Baroda Museum, Vadodara.— The Museum added to its collection the following " antiquities : Two white marble stone images of Jain Tirthankar, Patan, a marble stone hooded serpent, a schist stone image of Vishnu from Dang and a Persian document of AH 1031 (AD 1622) i.e. of the Jahangir period from Baroda.

39. Archaeological Museum, Vaishali.— The Museum acquired eleven terracotta objects from Mid-eastern Circle, Patna, Bihar.

40. Archaeological Museum, Velha Goa.— The museum was thoroughly organised to synchronize CHOGM. (Plates 92 & 93). Antiquities from the reserve collection along with newly acquired objects were displayed with a view to present "Goa Through the Ages".

Selected portraits of Governors and Viceroys of Goa from AD 1510 to AD 1961 and a good number of photographs of ancient Churches of India were displayed in the museum. Besides, thirty antiquities connected with Christian Art were added to the collection.

ARCHITECTURAL SURVEY

Temple Survey, Northern Region.— The Temple Survey Project, Northern Region of the Survey, under R.D. Trivedi continued the survey of the temples of the Pratihara period in Central India. The well-known Teli-ka-Mandir at Gwalior fort, Gwalior, was surveyed in context with other contemporary temples of the region. The *garbha-griha* of the temple, rectangular in plan, is preceded by a spacious *antarala* inside a gigantic doorway. The temple is notable for its *valabhi* (wagon-vault) type sikhara. The characteristic of rectangular plan and valabhi type superstructure of the temple is already noted at Naresar, District Morena, 25 kilometres away from the Gwalior fort. It suggests that the tradition of temples on rectangular plan with *valabhi* type superstructure was not unkown in the region at the time when the Teli-ka-Mandir was constructed. Its unusual *adhishthana* mouldings are surmounted by a recessed frieze carved with sculptured niches and foliage scrolls. The *jangha* of the temple is occupied by large doorways of the shrines on the central *bhadras* (Pl. 94). The western side being more elongated due to rectangular plan of the temple has *prati-rathas* flanking the *bhadra-ratha.* The *karnas* carry niches surmounted by *udgamas* (pediments) simulating a *sikhara* topped with an *amalaka.* the *varandika* of the temple consists of five prominent mouldings which are similar in character and sequence to those in the temples at Naresar, District Morena and Amrol, District Gwalior. On the northern and southern sides, the lower part of the *sikhara* carries a *chaitya-window* niche on each side containing the image of a goddess.

The lower part of the door jambs is occupied by the images of the river goddesses, Ganga and Yamuna, on the left and right sides respectively, each attended by a *chhatra-dharini* and a Saiva *dvara-pala* (doorkeeper) besides other figures. The door jambs are carved in five *sakhas (pancha-sakha)* with a flying figure of Garuda at the *lalatabimba* on the top. The *antarala* is provided with another door frame, carved with *dvara-sakhas,* leading to the *garbha-griha.* The images of Siva and the gods of his family including Sakti occur predominantly in the temple. Keeping in view the rectangular plan of the temple and other relevant examples of such temples, it appears that the Teli-ka-Mandir was dedicated to Saktis or Matrikas whose two images in the *chaitya-niches* facing the northern and southern directions on the lower part of the *sikhara* are still intact. On the basis of a comparative study of certain architectural features

of the temple with those of other temples in the region encountered at Amrol (District Gwa-lior), Naresar and Batesara (District Morena), the Teli-ka-Mandir is dateable to the later half of the eighth century AD.

The Chaturbhuja temple at Gwalior fort is a unique example of the Pratihara period being a rock-cut edifice and precisely dated to 875 to 876 AD on the basis of the inscriptions of the time of Bhojadeva of the Pratihara dynasty. The rock-cut temple, imitating all the details of a structural temple, from inside as well as from outside, consists of a *garbha-griha* and a *mukha-mandapa* (Pl. 95). The *adhishthana* mouldings are decorated with niches containing various deities including Ganesa, Kartikeya and Parvati on the *Bhadras*. The *Jangha* has pilastered niches on the *bhadras* and *karnas* surmounted by *udgamas* (pediments) carved with *chaitya*-mesh design. The three *bhadra-niches* of the *jangha* contain images of Nri-varaha on the south, four-armed standing Vishnu on the west and Trivikrama on the north, as the temple was dedicated to Vishnu. The other incarnations of Vishnu are carved in the subsidiary niches. In the *karna*-niches are represented the *Ashta-dikpalas* with their *vahanas* facing their respective directions. The *varandika* portion with three mouldings supports the *sikhara* preserved up to three *bhumis* marked with *karnamalakas*. The three-tiered *suka-nasika* on the eastern side of the *sikhara* is carved with a *chaitya-niche* containing a four-armed seated image of Vishnu.

The *mukha-mandapa* resting on two front pillars has, on the inner side, three lintels carved with *Krishna-lila* scenes. The doorway leading to the *garbha-griha* is flanked by the river goddesses, Ganga and Yamuna on the lower side. The *lalata-bimba* is carved with the figure of Garuda holding tails of the *naga-sakha* which terminates over the river-goddesses with the busts of *nagas* (serpents). The two dated inscriptions of the time of Srimad-adivaraha Bhojadeva gave valuable information regarding the construction and maintenance of the temple. The monolithic and rock-cut character of the temple is notably indicated in the first inscription by the terms 'ekasila' (in a single piece of rock) and *'tankotkirna'* (cut by the chisel). The second inscription, besides recording various donations to the temples, mentions the constructions of a Nava-Durga temple, whose location is not traceable in the vicinity Gwalior fort.

Architectural Survey of Monuments.— The Architectural Survey branch of the Department of Archaeology and Museums, Rajasthan, Jaipur, under the direction of O.P. Sharma conducted a survey of monuments in Kota district and Jaipur city. Under this project ancient temples, mosques, forts, cenotaphs, buildings and baories were surveyed and studied with special reference to the *haveli* architecture of the Vaishnavite temples of Mathuradhish and Mahaprabhuji temples at Kota, which give information regarding a particular style and technique of the Pushtimargiya sect. The prominence of Vaishnavite temples in Hadoti and the existence of Shaivite temples like Karneshwar temple at Kota, Shiva temple at Kelwara (Kota), and, the Shiva temple at Bhandadevra (Kota) in the region gives additional information regarding the art tradition of the Shaiva-Shakta style of architecture.

The temples of the Medieval period, viz. Siva temple at Ramgarh (Kota) and Chaturbhuj and Keshava temples at Kota of late medieval times are embellished with sculptures at the

exterior as well as in the interior. Sites with eleventh-twelfth century AD temples at Kaithoon and Shiva temple of tenth century AD near Palari Hindoli, Jodhpur were discovered.

A number of unknown monuments at Kaithoon, Kelwara, Vilas, Kota, etc. scattered sculptural fragments have been discovered.

A list of the temples, chhataries, and mosques situated at Jaipur was prepared.

The paintings at Pundarik-ji-ki-Haveli, Sisodia Rani-ka-bagh and a good number of cenotaphs at Jaipur confirm the view that decoration of all types of buildings with fine paintings was popular during eighteenth-nineteenth centuries AD and murals had become an integral part of architecture.

Building Survey Project

In Continuation of last year work (Indian Archaeology 1982-83, pp.178-183) the Building Survey Project carried out the architectural survey of secular buildings in Delhi, Gujarat, Maharashtra, Rajasthan and Uttar Pradesh under the direction of W.H. Siddiqi, assisted by J.B. Chand, C.P. Satsangi and S.K. Arora.

DELHI

About hundred and fifty secular structures including Mughal *havelis* were inspected in ancient localities of Delhi and the walled city of Shahjahanabad whose survey and documentation is in progress. The earliest example of Thirteenth-Fourteenth century residential building remains were observed in Malikpur village, popularly called Sultan Garhi. The roofless structures of rubble and thick lime mortar were found having arched entrances, verndahs, courtyards and rooms.

The architectural remains of Sarai Sohal at Palam were also carefully examined and found to belong to the later Mughal period. Built in *lakhauri* bricks the structural remains consisted of the arched entrance gate, fortification walls and a mosque with wagon vault of Bengal variety. To the same period belonged the Sarai Mahram and the enclosed market called katra Mahram Nagar, standing about hundred metres east of Palam Airport. The Mughal gateways and fortification walls of the Sarai, *Chaupal* and the mosque are notable for their architectural merit. The katra has enclosed avast area, more than hundred acres, with *lakhauri* brick and rubble walls, originally covered with fine lime plaster. The remaining structures of the arcades and octagonal bastions with arched openings on all sides, testify to their original glory.

The *haveli* of Paras Das Jain, situated in the Chandni Chowk, Shahjahanabad, is notable for its size and architectural features. Built over a raised square platform, it is approached through a stepped entrance gate of double storey. The entire building is built in *lakhauri* bricks, with Shahjahani marble pillars and an ornamental marble fountain. Over the *teh-khana* or underground hall, is the building of *Diwan-Khana* with marble flooring. The Diwan-Khana consists of two bay deep rectangular halls supported on foliated marble pillars and cusped arches in brick, covered with white plaster and the apex being decorated with *guldastas.* From

the platform of the Diwan Khana projects a rectangular *shahnashin* raised over marble pillars and cusped arches, surmounted by carved railings of lattice work and fine floral designs. The side walls and wooden ceilings of Diwan-khana were embellished with floral carvings of carpet design, painted with bright colours. The upper two floors follow the same plans.

A double storeyed *haveli* approachable from Chandni Chowk is located in the famous Kucha Rahaman and is popularly called Simla Wali Haveli. Built in *lakhauri* bricks on a square platform, it is approached by a rectangular narrow *deorhi* connected with two rectangular *baithaks* or sitting rooms for male and female visitors, still carpeted in the traditional fashion with *chandni* and *masnads.* It has a square courtyard with stone flooring. The Diwan-khana of the *haveli* is built over a raised platform with three arched openings of cusped variety, now partly covered with semi-circular wooden frames with coloured glasses. It is two bay deep, supported on Shahjahani pillars and pilasters. The eastern and western sides have triarched *sihdaris* apartments and living rooms. The walls of the *Diwan Khana* are covered with white lime plaster and pierced with deep niches, having wreath designs in relief comparable to those of the Gate house of Safdarjang tomb, New Delhi. The *kamani* of the wide arches of the *sihdari* are remarkable from architectural points of view. The wooden ceilings had coloured paintings whose remains are still visible in the apartments of the first floor. Its kitchen, ham-mam and lavatory has the original later Mughal setting. It is nearly two hundred years old, according to its occupant Muhammad Taiyab.

Situated in katra Khushal Rai is the remains of famous Shish Mahal, represented by its large and spacious hall consisting of wide arched facade supported on foliated pillars and pilasters. Built in *lakhauri* bricks and embellished with fine Mughal plaster and paintings, it was erected during the reign of Mughal emperor Muhammad Shah and was occupied by Mirza Khurshid Irani. In the Chah Rahat area of the same place is another later Mughal house popularly known as Sant Lal-ki-haveli. The house evidently follows the conventional plan of the Mughal *havelis* with large *deorhi,* spacious courtyard, raised *Diwan-Khana,* arched verandahs and living rooms on both the floors.

Another Mughal *haveli,* popularly known as Mahalsara, is now partly extant at the western corner of Gali Qasim Jan in Ballimaran. It has an impressive double storeyed arched entrance gateway of Shahjanani style, with projecting balconies of *jharukha* pattern. At the balcony level there is a rectangular gallery which was used as Naubat-khana. On the northern and southern sides are provided tri-arched gallery of *sihdari* of a later Mughal pattern, usually provided in *havelis.* The internal arched openings are supported in double sets of fluted Shahjahani pillars which are in red sandstone but covered with thick coat of lime. The *sihdari* have a Bangla roof pattern in plaster in relief which is comparable to that of the gateway of Safdarjang tomb. The soffits of the arches had stucco geometric designs in relief, partly still extant.

The Diwan-khana is impressive and its facade reflects Mughal glory. The facade of the hall is provided with broad eave of Mughal variety, raised on the shoulder cornices which have iron rings for hanging the *shaminas.* At its western end is a raised stone platform over which a shahnashin is constructed with the support of double sets of tall Shahjahani pillars. The walls are provided with deep niches of multifoil arches. The Mughal plaster of the dado is partly

sticking at certain places. The *shnashin* is of sufficient historical interest as it is reported to have been the place where the marriage of the illustrious Urdu poet Mirza Asadullah Khan Ghalib was celebrated on 7th Rajab. A.H. 1225 (August, AD 1810). This Mahalsara was owned by Nawwab Ilahi Bakhsh Maruf of Loharu, father-in-law of Mirza Ghalib. It is now owned by Hamida Sultan Ahmad, sister of Fakhru-Din AH Ahmad, former President of India.

GUJARAT

Nearly two hundred years old brick and wooden building known as Javeri-ki-haveli is situated in the walled city of Ahmedabad. It is remarkable for its architectural elegance. Originally a double storeyed house, it has now a three tier arrangement, the top-one added at a very late date. Built over a masonry platform, about one metre high from the ground level, it has the entire facade erected with fluted wooden pillars, supported on carved stone bases, wooden brackets, lintels and projecting balconies with exqusitely fine carving and row of elephant heads with other sculptural motifs. The wooden jambs of the *darichas* (windows) and engaged columns are embellished with fine floral designs. The brackets or struts of the pillars, supporting the projecting balconies have inspiration from the medieval temples of Gujarat. The wooden lintels are supported on beautifully carved brackets and projecting lion heads. Another double storeyed building of same style is known as Yogesh Bhai-ki-haveli. Its facade is raised on double sets of square wooden pillars, supported on beautifully carved stone bases. The space between the two shafts is filled in with wooden carved vertical panels in delicate floral design. The wooden doorway of 1jie *haveli* of Shri Shelpani Lakshmi Shankar Shastri is also noteworthy for its profuse carvings and intricate designs

The house known as-Barot-ki-haveli is an impressive three storeyed structure with interesting architectural features. Built over the raised platform, its facade is supported on beautiful ornamental pillars and capitals with sculptural representation of elephant heads as auspicious symbols. The wooden columns seem to have direct inspiration from the variety of stone pillars used in the second floor of Panch Mahal at Fatehpur Sikiri. Similarly the wooden brackets of the first floor of elephant trunk design is almost of the same type as is noticed in the halls of the building of the tresury of gold and silver (Ankh-Michauli) adjacent to Diwan-i-khas at Fethpur Sikri.

Another building at Nadiad in District Khera is also notable for its elegant fluted wooden pillars, richly carved struts, brackts and lintels of the projecting facade of the verandah and the balcony of the first floor.

RAJASTHAN .

An impressive three storeyed residential building at Kaman District Bharatpur is known as

Chaudhari-ki-haveli. Its tri-arched projecting balcony on the entrance gate and the top floor having Mughal type *nashiman* and *chau-chala* Bangla roof are of sufficient architectural interest. It is dateable to early eighteenth century on stylistic grounds.

A ruined entrance gate of a *haveli* at Dig is notable for its lofty ogee recessed arched opening with curviliniar stone projecting *chhajjas* with *jharukha* balcony, crowned with Bengal vault.

MAHARASHTRA

A good number of domestic architectural remains were observed in different cities of Maharashtra. More than two hundred years old building remains of dockyard at Church Gate and Mahim were noticed. The domestic architectural specimens were also noticed at Jogesh-wari, village Pali and Mahim near the Dargah of Makhdum Shaikh 'Ali.

UTTAR PRADESH

In Agra city, Kinari Bazar, part of the original Mughal township and its original planning of the market place with a main road and narrow lanes, was examined. Long rows of balconied houses of multifoil arches of later Mughal period were noticed and photographed. The red sand stone pavements of that period were also documented. The Mughal structures of chowk with wooden balconies and lattice work marked the continuation of earlier architectural setting and ornamentation. An impressive building of a *sarai* in the heart of Chhibitola was found to be remarkable for its architectural features. It was built by a Mughal nobleman Ilahwardi Khan during the reign of emperor Jahangir. Its eastern main gate consists of a lofty pointed deep arch, lined with, marble and blue tiles. The engaged turrests are surmounted with cupolas, embellished with blue tiles. The domed chamber of the gate had beautiful stucco ornamentation and colour paintings. Its courtyard and arches or *hujras* are now used as wholsale market. The devices used for ventilation through the drums of the brick domes are of rare design. The impressive *haveli* of Prince Dara Shikoh is now represented by magnificent domed bastions standing on the western bank of the Yamuna. Not far form it, is the structural remains of the library building of the same Prince. Its interior surfaces are covered with fine Mughal Plaster and panels of paintings.

The *haveli* known as Akhtar Manzil in kashmiri Bazar consists of a spacious courtyard having double storeyed *diwan khana,* halls and rooms, built in *lakhauri* bricks and lime mortar, covered with white Mughal plaster, which has become greyish with the weather effects. The flat roofs were supported on thick wooden beams and rafters which were painted in colours. The western portion is occupied by a well-known Urdu poet 'Alam Fatehpuri. The southern portion is now housing a shoe making *karkhana* of Shri Wahabud-Din.

Another impressive *haveli,* situated in Pipal Mandi locality is popularly called kalan Mahal, and is used as Indra Bhan Girls High School. Mirza Ghalib was born in this bouse on 27th December, 1797. It has undergone alteration and reconstruction but certain architectural

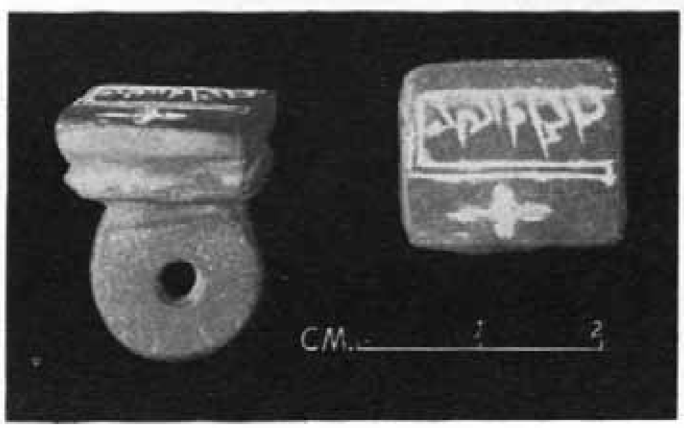
members still retain the later Mughal architectural features. Another *haveli* of the same period is occupied by another famous Urdu poet 'Allama Maikash Akbarabadi whose baithak, Diwan khana and sahnchis are still maintained with later Mughal furnishings, wall hangings and glass chandliers.

At the western end of Lucknow city, is situated the remains of Musabagh laid out by Nawab Asafud-Daula, and a house built in Lakhauri bricks having stucco (araish) work of Avadh pattern. It was erected in the Indo-European stype by General Martin for Nawab Saadat Ali Khan who used to enjoy animal fights in its compound. It was badly damaged during the struggle for freedom in 1857. The roofless double storeyed structure with balconies, windows, water channels and cisterns represents the early phase of Indo-European style of architecture at Lucknow.

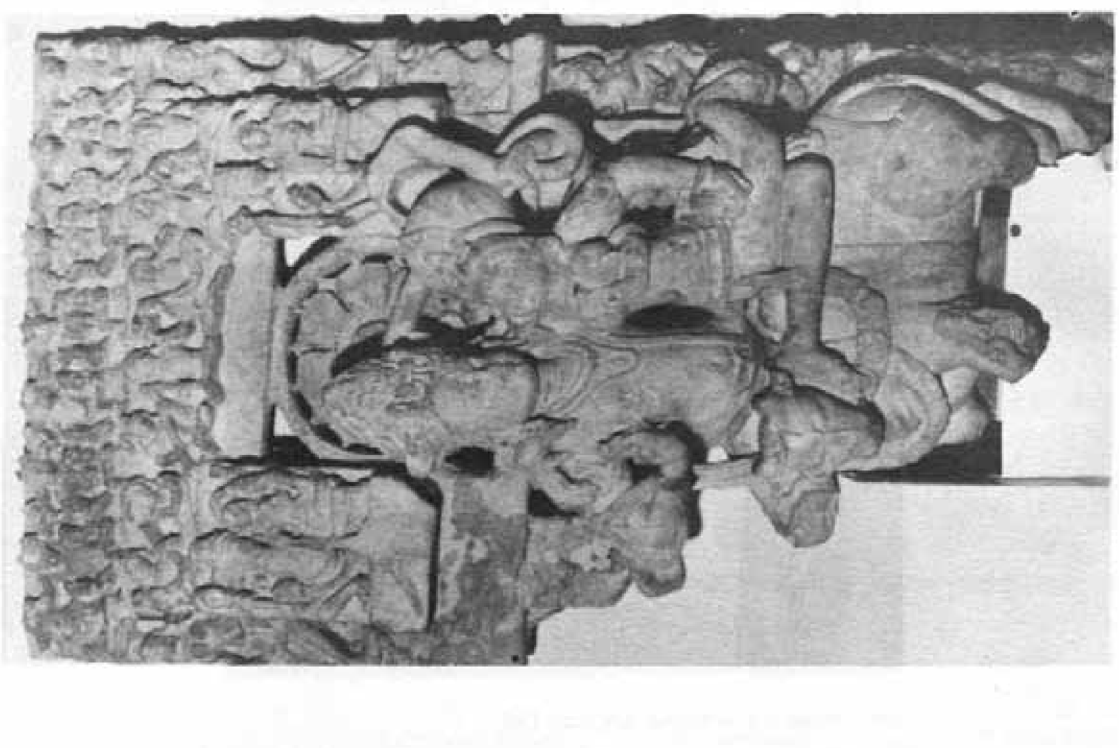
At gorakhpur the *haveli* attached to the immambara belonged to the period of Nawabs of Avadh. According to family records of Sayyid Mazhar Ali Shah, the Immambara and *haveli* were constructed with the help of Nawab Asafud-Daula,of Lucknow for the merit of a saint, who was the ancestor of the present trustee. It houses the Imambara Girls College in the double storey arcades and spacious halls and corner rooms. Built in *lakhuri* bricks and lime mortar the entrance gate of the Imambara and *haveli* complex, is very impressive. The projecting lofty facade is notable for its graceful pointed inner arch and multifoil wide cusped arch, flanked by *jharukha* windows and deep niches. The spandrils of the arch have beautiful pair of fish in plaster, ‘symbolising the emblem of the Nawabs of Avadh. The inner surfaces of the Imambara are remarkable for beautiful calligraphic panels and floral designs in stone and plaster.



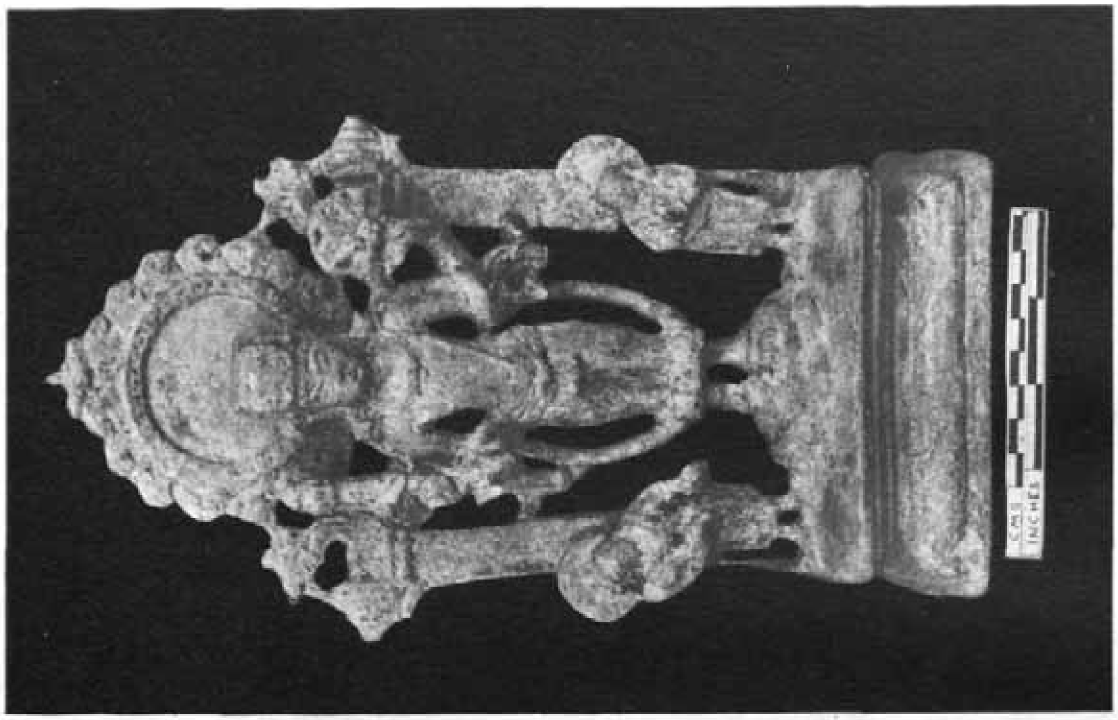
80 Srinagar: Head of Siva? *See page 168*



81 Malhar: Stone Seal. *See page 168*



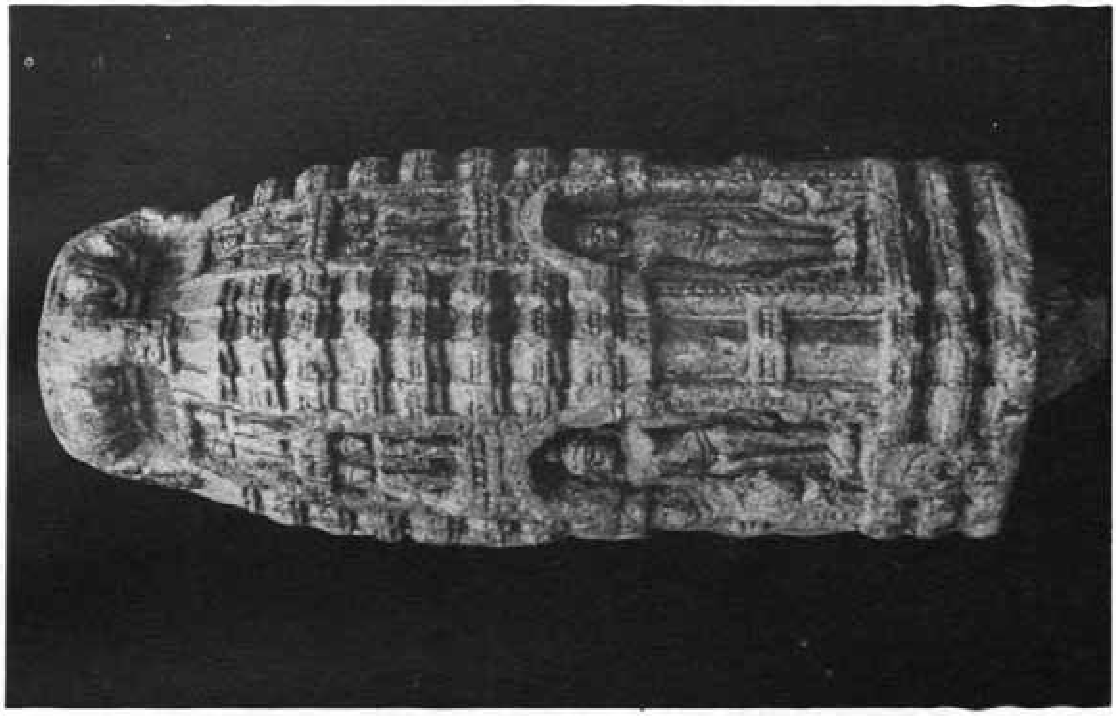
82 Ghanauli: Uma Mahesvar, *See page 169*



83 Kasipur: Metal image of Vishnu, *See page 171*



84 Kasipur: Metal image of Kalyan Sundar Siva. *See page 171*



85 Kotal Pur: Miniature votive Jain Shrine (Stone). *See page 172*



86 Sagardighi: Buddhist goddess Marichi (Stone). *See page 172*

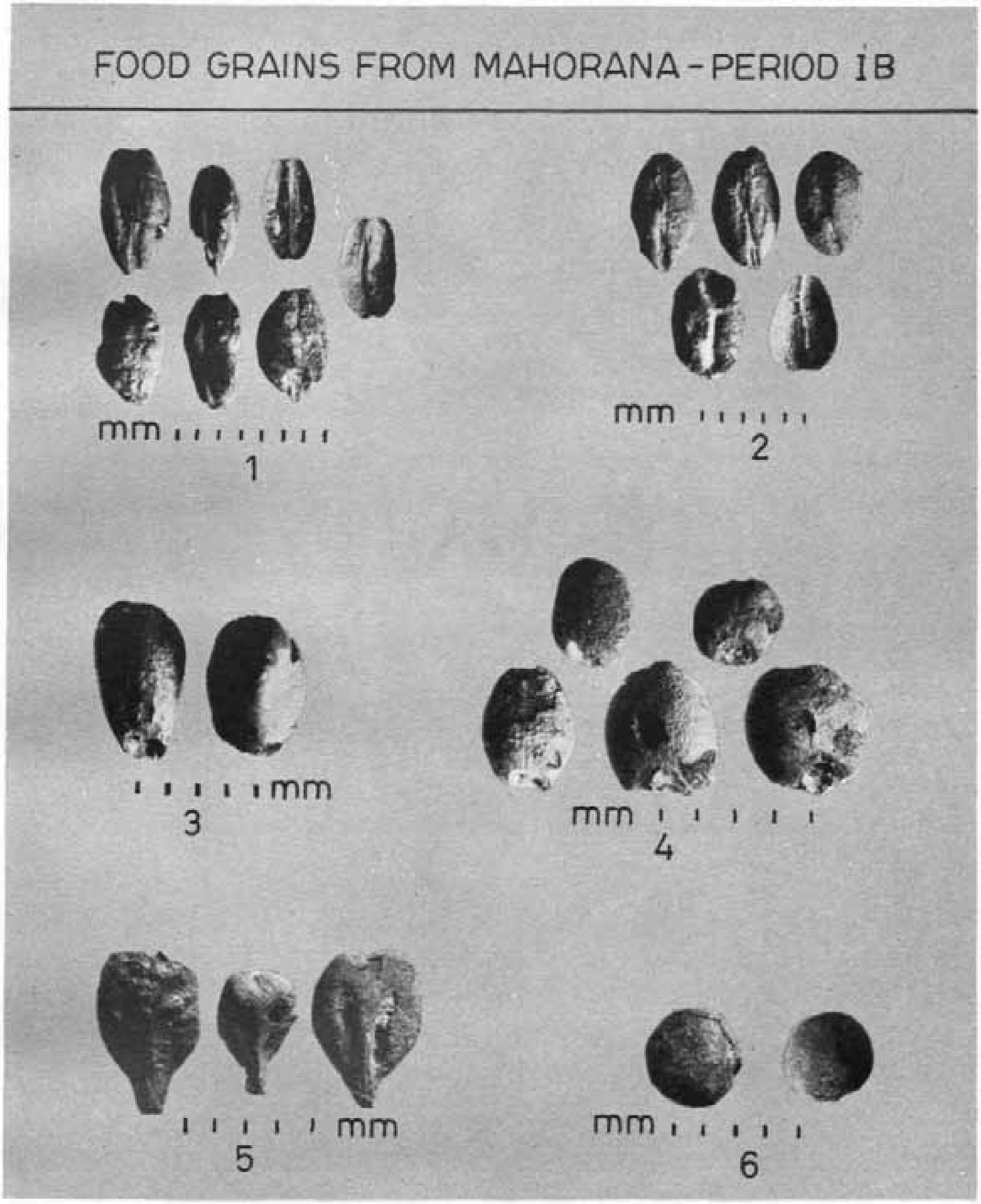


Plate 87

Fig. 1.	Hulled berley *(Hordeum vulgare* L.)	Fig. 4.	Dwarf wheat (I. *spharococcum* Perc.)
Fig. 2.	Naked barley *(H. vulgare* L. var. *nudum)*	Fig. 5.	Grape pipa *(Vitis vinifera* L.)
Fig. 3.	Club wheat *(Iriticum compactum* Host.)	Fig. 6.	Lentil *(Lens culineris* Maedik.)

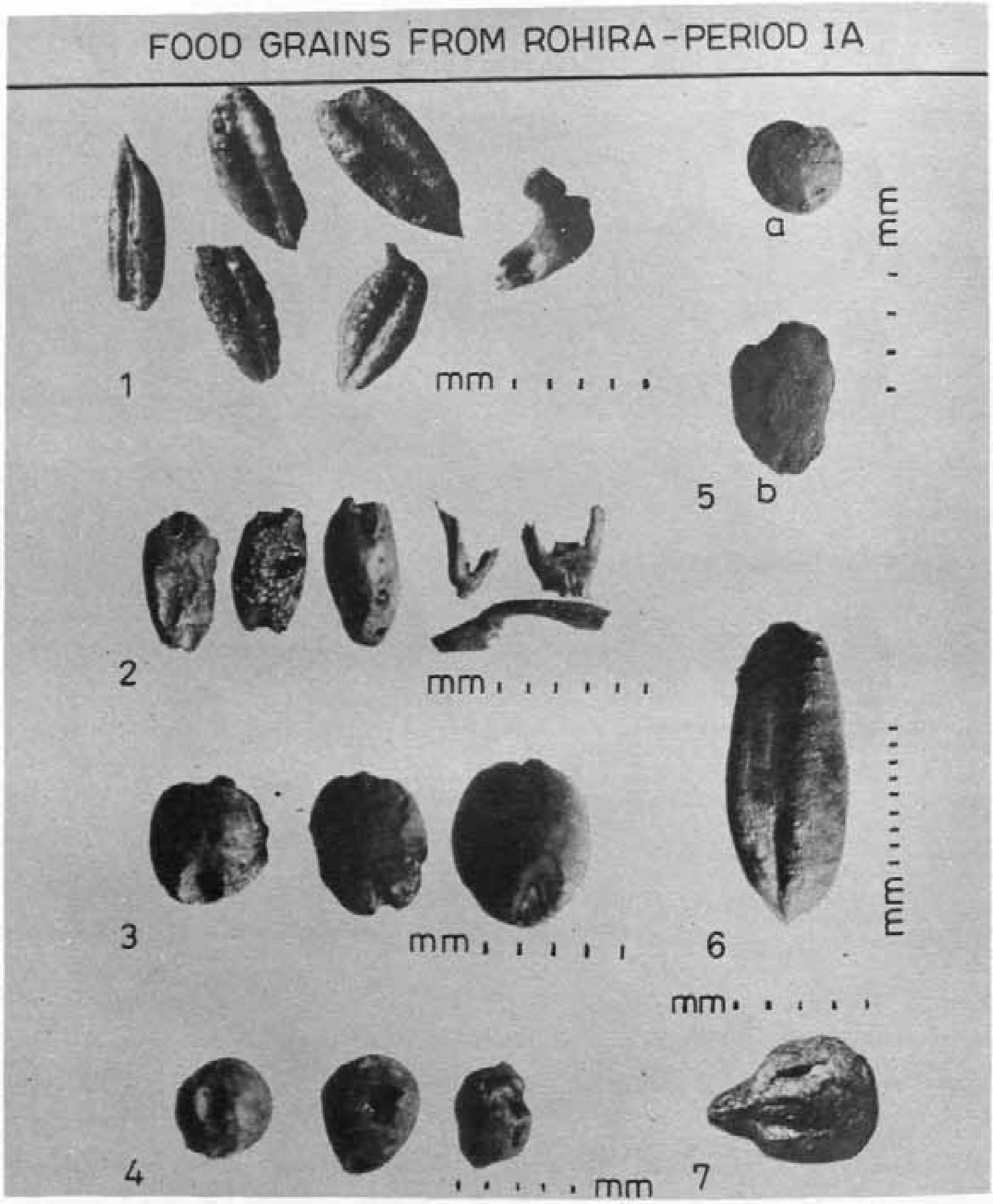
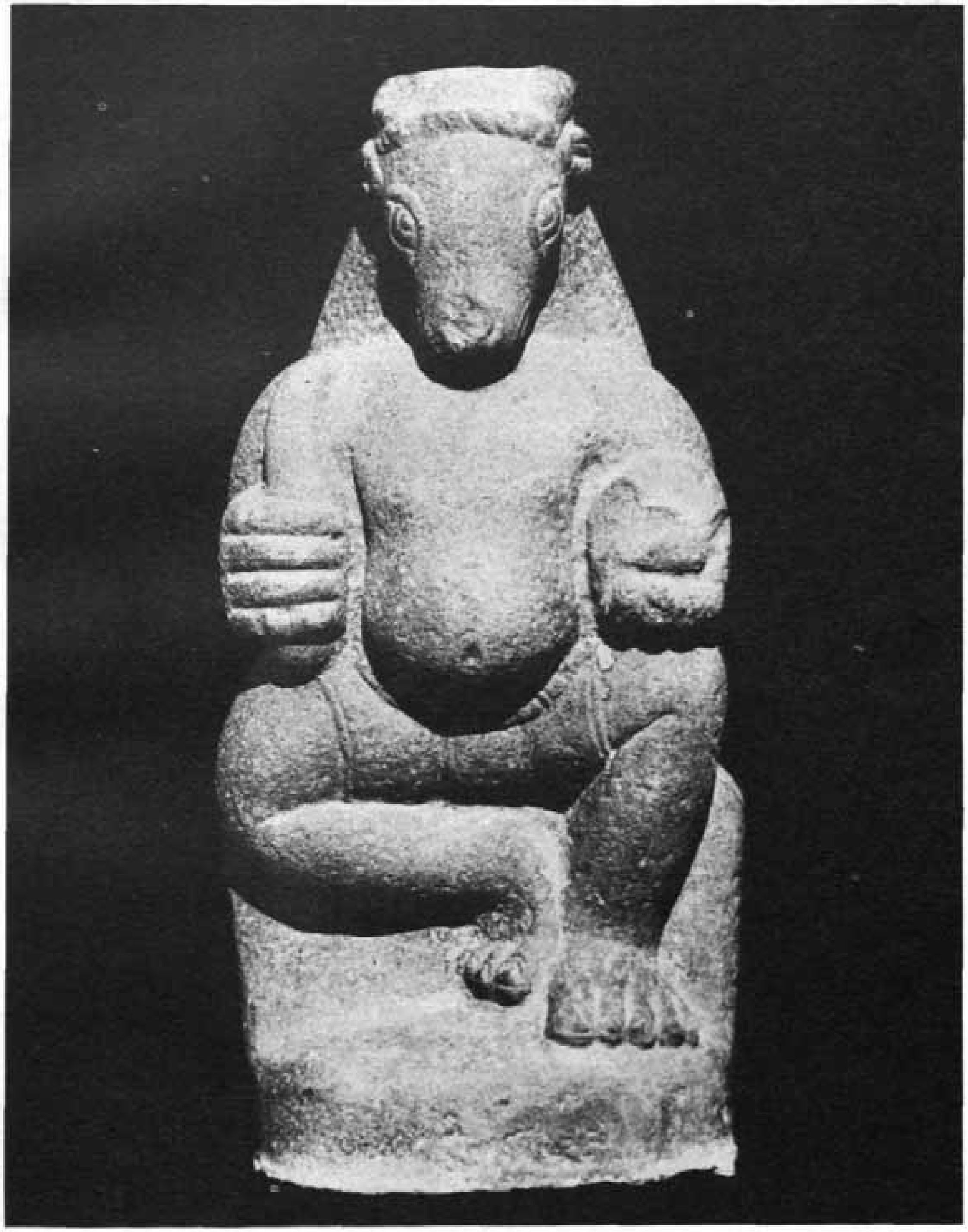


Plate 88

Fig. 1. Hulled barley *(Hordeum vulgare* L.)
Fig. 2. Emmer wheat *(Iriticum dicoccum* Schubl.)
Fig. 3. Dwarf wheat *(I sphaerococcum* Perc.)
Fig. 4. Jowar-millet *(Sorghum vulgare* L.)
Fig. 5. Lentil *(Lens culinaris* Maedik.)
Fig. 5b. Horsegram *(Dolichos biflorus* L.)
Fig. 6. Date stone *(Phoenix* sp.)
Fig. 7. Grape pip *(Vitis vinifera* L.)



89 Gauhati Museum: Daksha. *See page 181*



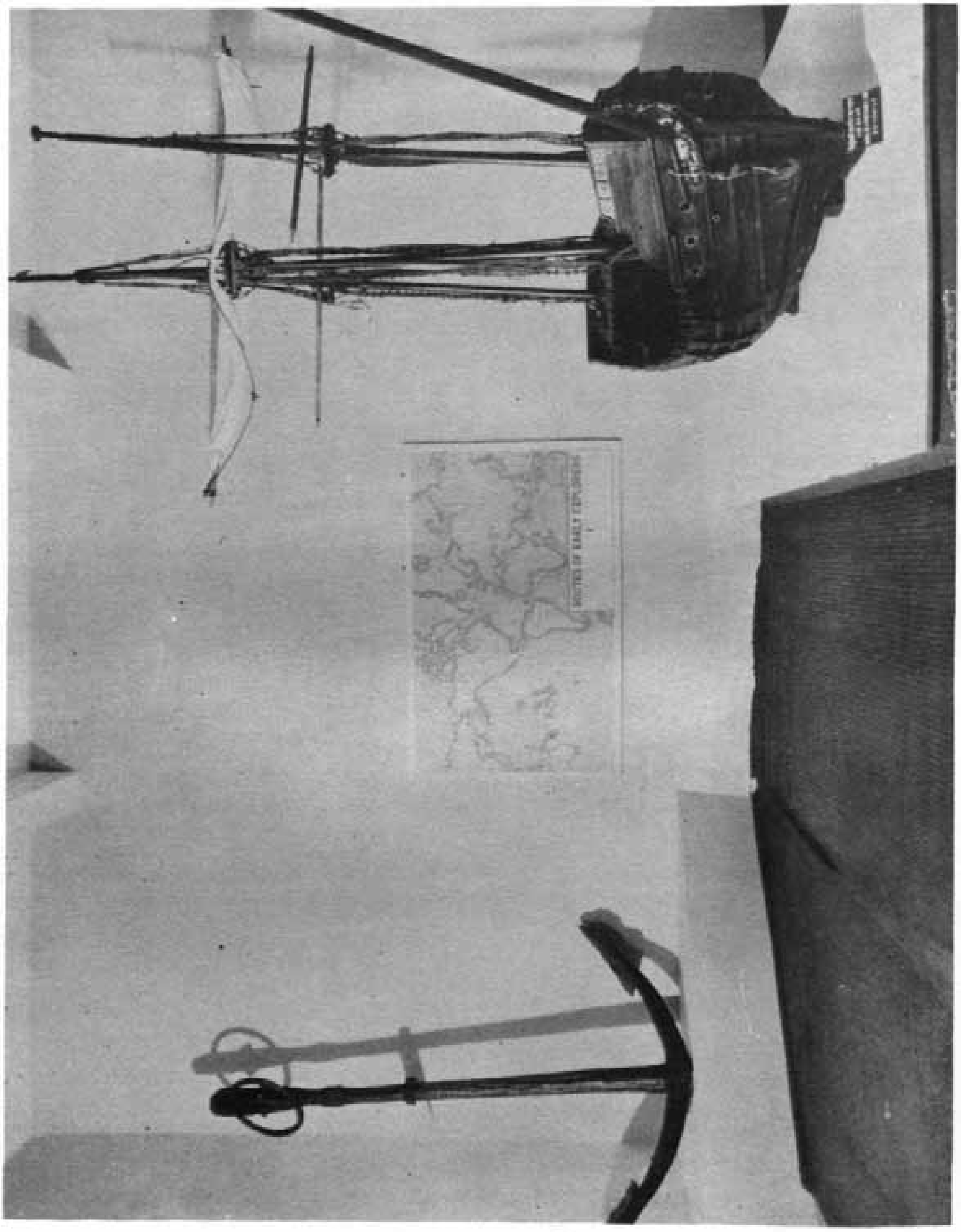
90 Gauhati Museum: Parvati. *See page 181*



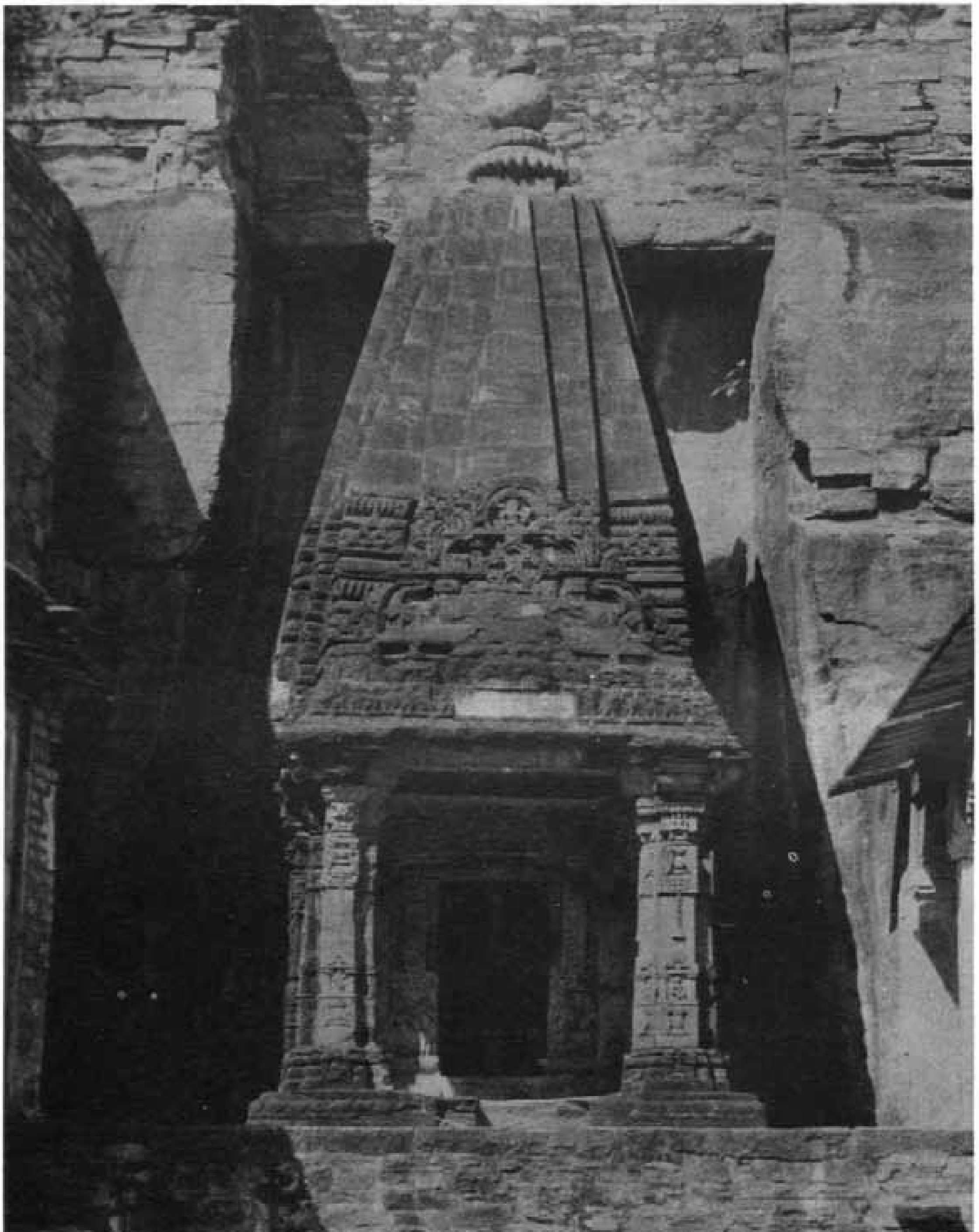
91 State Museum Lucknow: Zodiocal Coin of emperor Jahangir. *See page 182*



92 Velha Goa Museum: Partial View of the key gallery (North-West corner) from south-East. *See page 184*



93 Velha Goa Museum: General view of the Gallery No. 3. *See page 184*



95 Gwalior: General view of Chaturbhuja temple. *See page 187*

PRESERVATION OF MONUMENTS

Monuments of National Importance

Central Circle

MADHYA PRADESH

1. Kamlapati Palace, Bhopal, District Bhopal.— The work of grouting of cracks, re placement of old decayed plaster of walls and floors to protect it from further damage is in progress.

2. **Vishvanath Temple, Khajuraho, District Chhatarpur.— In** continuation of last year's work (1982-83, p. 184), the sealing of open wide joints, hollow cavities and water-tightening of the temple was completed. The iron door-shutters were repainted to keep them free from rusting and corrosion.

3. **Vaman Temple, Khajuraho, District Chhatarpur.—** The work of sealing of open wide joints, hallow cavities and water-tightening of the temple was completed. The iron door-shut ters and fencing posts were repainted for better look and to keep them free from rusting and corrosion.

4. **Western Group of Temples, Khajuraho, District Chhatarpur.—** In continuation of last year's work (1982-83 p. 184), the repainting of doors and window shutters of the temples of the western group was completed. Steps were taken to improve the general view of the western group of temple complex which was given a facelift and the roads and pathways leading to the temples were improved by spreading red morrum.

5. **Sidheshwar Temple, Nemawar, District Dewas.-** The work of grouting the vertical crack of bastion, and repairs of damaged and washed away ghats of the Narmada River is in progress.

6. Rock-cut Caves, Bagh, District Dhar.— In continuation of last year's work (1982-83, PP. 184-185) two more deteriorated pillars in Cave No. 2 were dismantled and replaced with new R.C.C. pillars matching to the original, (Pls. 96, 97).

The consolidation of the roof of caves, on account of the seepage of water, was through massive drilling and grouting programme done in collaboration with the Geological Survey of India, Nagpur, Mineral Exploration Corporation, Nagpur; and Central Mining Centre, Dhanbad. The work was done with specially designed pneumatic compressed air driven rotary drilling machines coupled with various other anciliaries. The ground floor plans of Caves No. 4, 5, 6

and 7 were excatly transferred to the roof of the caves and the portions of *chaitya,* cells, pillars and stupas were elaborately marked thereupon. The bore hole points, thereafter, were selected strategically both for curtain and blanket grouting to arrest seepage of water.

The bore points located for the curtain grouting were at about 5 metres away from outer extremities of the caves and drilled up to 22 metres deep going 2 metres below the existing floor level of the caves. After providing cement grouted curtain on the eastern and southern sides of the caves at cliff, the bore holes at 5 metres centre to centre were also determined and marked over the roof surface of the caves. These bore hole points selected for the roof consolidation were drilled up to the depth of 10 to 12 metres leaving a margin of 3 metres from the ceiling of the caves to allow the cement slurry to spread and fill up all the fissures and cavities. The holes bored were grouted by injecting liquid cement slurry with the help of a specially designed grouting machine at pressure of 2.5 kg. and the holes were finally sealed by filling reinforced cement concrete forming a cement grouted blanket in the roof. It was found that there is a significant achievement in the reduction of seepage, percolation of water and the falling of chunks of rock from the roof of the caves.

In Cave No. 4 five R.C.C. Pillars matching to the original ones in colour, tone and texture were also introduced. The work is still in progress.

7. Water Palace, Mandu, District Dhar.— Dismantling of old decayed lime concrete of floor and raking out the roof surface for relaying a fresh lime concrete floor and water-tighten ing of roof is in progress.

8. Delhi Darwaza, Mandu, District Dhar.— Restoration of a damaged stone masonry of fortification wall adjoining the Delhi Darwaza and the replacement of decayed lime concrete of an adjoining mosque with fresh lime concrete for floor and roof is in progress.

9. Mahadeo Temple, Deobaloda, District, Durg.— The work of grooving sandstone beams of a ceiling for inserting R.S.I. girders for joining the cracked beams with araldite for the removal of temporary supports erected to support the broken beams to give an original look was initiated.

10. Chauk Mohalla Hamman, Burhanpur, District East Nimar.— The underpinning of cavities of walls, filling of sunken and hollow floors, concretizinng of floor and water-tighten ing of domes to check the rain water seepage are in progress. (Pls. 98,99).

11. Old Fort, Burhanpur, District East Nimar.— Restoration of damaged and collapsed fort wall with random rubble stone masonry in 1:2 *hanker* lime mortar matching to the original is in progress.

12. Bada Madrasa, Chanderi, District Guna.— Replacement of broken stone slabs of ceil ings and deteriorated and missing flagstone floorings with new ones is in progress. (Pls. 100, 101).

13. Guard Room, Gwalior Fort, District Gwalior.— In continuation of last year's work (1982-83, p. 185) of relaying fresh lime concrete on terrace with a proper slope and drainage for quick run-off of rain water is in progress at a guard room in the complex of Man Mandir Palace.

14. Tomb of Mohmad Ghous, Gwalior, District Gwalior.— Restoration of a damaged and missing coursed rubble stone masonry compound wall in 1:6 cement mortar is in progress.

15. Chausath Yogini Temple, Bheraghat, District Jabalpur.— Replacement of damaged and decayed steps with new ones and providing stone pitching in the upper periphery for protection from erosion and safety of the visitors is in progress.

16. Madan Mahal, Jabalpur, District Jabalpur.— Underpinning the cavities with dry random rubble stone masonry, grouting the cracks and raising up the height of compound walls is in progress.

17. Vishnu Varaha Temple, Karitalai, District Jabalpur.— Repairs of the platform and refixing the colossal figure of Vishnu Varaha in position, repair of barbed wire fencing and water-tightening of the temple to check the seepage of rain water were completed.

18. Main Shrine of Shiva Temple, Bhojpur, District Raisen.— Restoration of wall corners and covering of the roof of the temple with original architectural members is in progress.

19. Jhinjhari Mahal, Raisen Fort, District Raisen.— The work of restoration of the crumbled and bulged dome and portion of a supporting wall, replacement of deteriorated, damaged and missing cut-stone flooring with new stones, and replacement of old, decayed lime concrete of floors with fresh lime concrete is in progress. Restoration of damaged and missing wall portions of the rooms and domes with random rubble stone masonry in 1:2 lime mortar mixed with 1/8 cement, matching to the original and water-tightening of domes was completed. (PLs.102, 103).

20. Approach Road, Sanchi, District Raisen.— Replacement of sunken, cracked and damaged cement concrete slabs of the approach road at Sanchi with fresh cement concrete slabs and restoration of missing and damaged parts of barbed wire fencing around the protected areas is in progress.

21. Mahadeo Temple, Pali, District Sagar.— In continuation of last year's work (1982-83, P. 186), construction of random rubble stone masonry compound wall was carried out further and the work is in progress.

22. Badal Mahal, Rahatgarh, District Sagar.- The work of restoration of damaged stone

wall and erection of temporary supports to the damaged high-roof is in progress.

23. Temple Ashta, District Seoni.— The work of repairs to the plinth platform and water tightening of the *Sikhara* to check the seepage of rain water is in progress.

24. Jain Temple, Pathari, District Vidisha.— The work of restoration of the collapsed dome and sanctum enclosure walls of the shrine with coursed rubble stone masonry in 1:2 lime mortar mixed with 1/8 cement and water-tightening the dome to arrest the seepage was completed. (Pls. 104,105).

25. Chhatri, Inside Sarai, Raverkhedi, District West Nimar.— The work of repairs of damaged steps, water-tightening of the *chhatri* and enclosing the protected area with barbed wire fencing on angle iron posts to check the encroachment is in progress.

26. Neelkantheshwar Temple, UN,District West Nimar.—The work of taking out and resetting the bulged ashlar masonry wall vestibules in original alignment, the removal of temporary angle iron-supports and grouting of cracks, cavities and joining of cracked stone beams was completed.

Delhi Circle

DELHI

27. Jama Masjid, Delhi.— Decayed and damaged red sand stone veneers of the wall were removed and replaced with new ones after treating the core masonry.

Broken and damaged stone *chhajjas* were removed and replaced with new ones after reproducing the minor moulding work as per original (work is in progress).

28. Red Fort, Delhi.— Bulged and damaged red sand stone veneers, in the eastern en closure (facing River Jamuna) were removed and replaced with new ones. Missing portions were filled with new slabs, including treating the core masonry and ensuring lateral and internal bonding as original.

29. Wazirabad Mosque, Delhi.— Loose masonry of the walls was stablished and made watertight.

30. Adilabad Fort, Adilabad, New Delhi.— The fortification remains were exposed after carefully clearing the accretions. Bulged and damaged masonry of the fortificftion was set right after stabilizing the loose masonry core. The fort walls were water-tightened.

31. Ghayasuddin Balban's Tomb, New Delhi.— Damaged masonry of the tomb was

underpinned, after stabilizing the core. The masonry was made watertight.

32. Hauz Khas Mosque, New Delhi.— The damaged projections of the balcony were reset and hollows and cavities in the masonry were filled and the masnory was made watertight.

33. Humayun's Tomb, New Delhi.— The work of restoration of the red sand stone floor ing of upper platform which was under progress last year was continued and completed.

34. Kotla Feroz Shah, New Delhi.— Damaged and out of plumb masonry walls of the whole complex were restored to original shape. The work of rendering the walls water-tight is in progress.

35. Purana Qila, New Delhi.— Collapsed portion of the northern fortification wall was restored as per original alignment, and made water-tight.

36. Sikandar Lodi's Tomb, New Delhi.— Dislodged masonry enclosure wall was reset and made watertight, damaged and sunken floor was repaired and brought to original level. Dam aged and missing battlements were restored; also the stucco work was reproduced as per origi-nal.

37. Tomb of Mohammadpur Tin Burji, New Delhi.— Damaged masonry of Western wall was restored and rendered watertight. The damaged and missing portions of the concerete floor of all three chambers were restored.

RAJASTHAN

38. Lachhvwa-ki-Deori, Neelkanth, District Alwar.— Disturbed and damaged lower most ramp and steps leading to the *kund* South-Western side were removed and replaced. The ramp was made watertight.

Eastern Circle

ORISSA

39. Brahmeswar Temple, Bhubaneswar, District Puri.- The stone works in the subsi diary temple were relaid. (Pls. 106,107).

40. Dakshaprajapati Temple, Banpur, District Puri.- The laterite pavement around the temple was relaid after removal of the vegetation from the temple.

41. Lingaraj Temple, Bhubaneshwar, District Puri.- In the *Natamandapa* of the temple,

bat proof ceiling was provided and the broken *pidha* of *jagamohana* was reset.

42. Jagannath Temple-Complex, Puri, District Puri.— In continuation of the last year's work (1982-83, P. 187), the broken, disintegrated members on *bandhana* and upper *jangha* were reset after consolidation and restoring the ornamental features.

43. Sun Temple, Konarak, District Puri.— In continuation of the last year's work (1982-83, P. 187) laying of an approach road to the main temple was partly completed.

WEST BENGAL

44. Basuli Temple-Complex, Nanoor, District Birbhum.— The old plaster was removed and cracks were filled by grouting.

45. Jaydev Temple, Jaydevkenduli, District Dirbhum.— The damaged floor was renewed with setting of bricks and poining.

46. Adina Mosque, Pandua, District Malda.— In continuation of the previous year's work (1982-83, P. 188).the two collapsed brick-pillars with arches around the eastern courtyard were restored. The worn out terraced floor was dismantled for relaying and the bulged out brick surface was reset. (Pls. 108,109).

47. Minar and Mosque of Murahidkuli Khan, Sabjikatra, District Murshidabad.— The eastern part of the dome was rebuilt and the *jali* works in the tomb were renewed. The accumulated earth and debris on the floor were removed.(Pls. 110, 111).

48. Ballal Dhibi, District Nadia.— The consolidation of brick structure in the excavated site was made in brick masonry laid in lime *surkhi* mortar and finished with recessed pointing. A provision of easy drainage was also made.

Mid-Eastern Circle

BIHAR

49. Ancient Site of Vikramshila, Antichak, District Bhagalpur.— The arterial intercept ing drainage network within the premises of the site was carried out in continuation of the previous year's work (1982-83, P. 189). The experiment on the departmental manufacture of the special size bricks for use in the structural repairs of the excavated remains was continued.

50. The Palace of Asoka, Kumrahar, District Patna.— The construction of the northern boundary wall of the site was resumed and completed.

51. Colossal Stupa, Nandangarh, District Champaran West.— In continuation of the previous year's work (1982-83, P. 189), the north-eastern portion of the stupa was rendered watertight by resetting the dilapidated brick masonry work which was finished with recessed pointing in lime *surkhi* mortar.

52. Shershah Suri's Tomb, Sasaram, District Rohtas.— The causeway, leading to Sher Shah Suri's Tomb was provided with a retaining wall at the water level to prevent erosion, after dismantling the leaning one.

53. Hasan Sur Shah's Tomb, Sasaram, District Rohtas.— The stinking water of the stepped tank on the north-west of the tomb was baled out followed by de-silting to admit fresh water. Besides this, the verandah floor and the terrace were reconditioned by laying lime con crete after dismantling the decayed areas.- The flight of steps leading down to the water level were rendered watertight by recess pointing after raking out the dead mortar from the stone masonry joints. The precincts on the north and south of the tank were provided with barbed wire fence mounted on a dwarf wall to prevent trespassing.

54. Excavated Remains, Nalanda, District Nalanda.— The circumambulatory pathway laid bare during the excavation at Sarai Mound was further strengthened by a layer of lime concrete.

55. Raja Baisal Ka Garh, Basarh, District Vaisali.— The dilapidated structural remains of the excavated site were reset and finished with recess pointing in lime *surkhi* mortar.

UTTAR PRADESH

56. Excavated Remains, Sringaverapura, District Allahabad.— The excavated remains were covered with alkathene to prevent damages due to rains.

57. Khusru Bagh, Allahabad, District Allahabad.— The decayed plaster was removed from the interior walls of the gate and replastered with cement lime mortar. The terraces of the gate were reconditioned with fresh lime concrete after dismantling the decayed one.

The decayed mortar was removed from the masonry joints of the inner and outer facades of the enclosure wall. They were pointed with fresh lime mortar. lime concrete was laid on **the** coping after removing the dead one.

58. Garhawa Fort, Sheorajpur, District **Allahabad.—** Recessed pointing was done after **raking out** the decayed mortar from the stone masonry joints of the structural remains of the **palace complex.**

59. Mrigadhara, Kalinjar, District Banda.— The escarpment facing the monument and

looking over the ravine, was bound with M.S. grill for the safety of the visitors.

60. Stupa and Monastery, Piprahwa, District Basti.— The trench in the stupa was filled with the excavated earth after consolidation. The upper brick courses were relaid and the missing gaps were filled with brick masonry keeping uniformity with the adjacent layers. The surface was finished with recessed pointing in lime *surkhi* mortar.

61. Budhist Remains, Kushinagar, District Deoria.— In continuation of the previous year's work (1982-83, P.190) the restoration of Nirvana stupa was continued. The cylindrical drum, hemispherical *anda* and the *harmika* of the stupa were plastered with cement mortar. The pathway from the main gate leading to the stupa was reconditioned.

The structural remains of the monastery 'F' were rendered watertight by resetting the dilapidated brick masonry with pointing in lime *surkhi* mortar.

The hemispherical surface of the Ramabhar stupa was water-tightened by resetting the upper 2 to 3 brick courses finished with pointing in lime *surkhi* mortar.

62. Aurangzeb's Pavilion, Bagh Badshahi, Khajua, District Fatehpur.— Fresh lime concrete was laid on the ground floor rooms and the upper terrace of the pavilion after remov ing the decayed concrete. The enclosure wall in *lakhauri* bricks, flanking the entrance gate, was pointed in lime cement mortar.

Mid-Southern Circle

KARNATAKA

63. Tippu Sultan's Palace, Bangalore, District Bangalore.— Damaged floor on the south western corner of the Palace was repaired. The south-eastern corner of the terrace was water-tightened and the entire terrace was cleaned and then a coat of waterproof cement paint was provided. The wooden members of the south-west wing were strengthened by applying two coats of a wood preservative.

64. Fort, Bangalore, District Bangalore.- The foundation of the fort wall was strengthened with cement concrete and reconstruction of the fallen wall started.

65. Kamalanarayana Temple, Dev Gaon, District Belgaum.- The roof was water-tight ened after removing the accumulated debris and resetting the roof slabs. The cracks on the ceil ing and the walls were grouted. The steps to the temple were reconditioned.

66. Anantasayana Temple, Anantasayanagudi, District Bellary.- The broken beam of the main entrance was strengthened by inserting an I- section R.S. Joists.

67. Excavated Remains, Hampi, District Bellary.- The excavated remains in the Mint area were consolidated by pointing and water-tightening the tops of walls.

68. Gangitti Temple, Hampi, District Bellary.- The broken beam of the front *mandapa*

was strengthened by inserting an I-section R.S. Joists.

69. Lotus Mahal, Hampi, District Bellary.— The damaged lime concrete floor has been relaid.

70. Kalleswara Temple, Hirehadagali, District Bellary.— The protected area around the monument was provided with barbed wire fencing and a wicket gate.

71. Huchimalligudi, Aihole, District Bijapur.— The area around the temple was properly levelled and provided with flagstone pavement to avoid stagnation of water. Water-tightening of the roof was also undertaken.

72. **Ladkhan Temple, Aihole, District Bijapur.—** Dismantling the houses in the acquired area, around the temple, was undertaken.

73. **Upper Shivalaya, Badami, District Bijapur.—** The floor slabs of the *mandapa* were relaid and the damaged perforated window on northern wall was replaced. The breached compound wall around the monument was also reconstructed.

74. **Asar Mahal, Bijapur, District Bijapur.—** The decayed wooden planks of the ceiling with paintings were replaced by the new ones and a weather proof course laid over the roof to prevent leakage.

75. **Golgumbaz, Bijapur, District Bijapur.—**The fallen part of the compound wall was reconstructed as per the original and the damaged gate was replaced.

76. Basavannadeva Temple, Hallur, District Bijapur.— The low-lying area around the temple was filled with *jelly* and gravel to prevent stagnation of rain water. The work of grou ting and pointing of the roof was also taken up.

77. **Ibrahim Rouza, Bijapur, District Bijapur.—** The work of resetting the dislodged members of the vaulted roof of dalans was continued.

78. Karimuddin Mosque, Bijapur, District Bijapur.— Windows and doors matching with the adjoining structures were provided to the arches.

79. Mehtari Mahal, Bijapur, District Bijapur.— Windows and doors were provided to the arches to prevent misuse of the monument during night.

80. Papanatha Temple, Pattadakal, District Bijapur.— Damaged flagstones of the roof were replaced to stop leakage.

81. Amruteswara Temple, Amrutapura, District Chikmagalur.— The damaged *prakara* wall on the northern side was reconstructed. The accretionary plaster on the parapet walls was removed to expose the original features.

82. Fort and Temples, Chitradurga, District Chitradurga.— The part of the fort wall at Kamanabagilu was reconstructed with ashlar masonry. The top of the wall was water-tightened to avoid seepage of rain water. The drain running below the *mandapa* of the Sampige Siddeswara temple was re- conditioned. Roofs of the Sampige Siddeswara and *Nandi* temples were water- tightened and the sunken flagstone pavement relaid. Steps were pro vided to the Ganesha temple. The protected area was fenced with barbed wire and a gate was provided.

83. Harihareshwara Temple, Harihar, District Chitradurga.— Three *deepa-stambhas* were out of plumb. They were reset to their original position after underpinning their foundation.

84. Keshava Temple, Belur, District Hassan.— The decayed wooden members of the frame inside the *vimana* of the Soumyanayaki shrine were replaced and the interior was suitably plastered. The plaster on the exterior of the *vimana* was scraped out and replastered. The pedestal of the main image of the Ranganayaki shrine which had gone out of plumb was reset. The sagging *prakara* wall on the southern side of the temple was underpinned to pre vent further damage.

85. Hoysaleswara Temple, Halebid, District Hassan.— Original *prakara* wall and base ment of the main gate were found while clearing the debris on the southern side of the tem ple. Car parking area in front of the temple was further extended.

86. Kalyani, Hulikere, District Hassan.— The northern and the western sides of the Kalyani were dismantled and reset suitably. The resetting of the whole tank was completed. (Plates 112,113,114,115).

87. Akkana Basti, Sravanabelagola, District Hassan.— The out of plumb architectural members of the *mandapa* were reset.

88. Gumbaz, Srirangapatna, District Mandya.— Old and decayed plaster on the walls of *Nagar-khana* was removed and replastering was done in combination mortar. The walls were coated with two coats of Snowcem of matching colour.

89. Jumma Masjid, Srirangapatna, District Mandya.— Concrete flooring was provided between the entrance and guard room to prevent stagnation of water.

90. Kesava Temple, Nagamangala, District. Mandya.— Water-tightening of the terrace of the *mahamandapa* with brick *jelly* concrete, after pointing the wide joints of the stone slabs, is in progress.

91. Mallikarjuna Temple, Basral, District Mandya.— The accretionary cement plaster over the brick structure of the entrance of the temple was removed and the surface was veneered with stone slabs. Dead concrete on the roof of the entrance was removed and a weather proof course relaid. The original floor of the *mandapa* covered with flagstone pavement and earth filling was also exposed and a flight of steps provided, (pls. 116, 117).

92. Keertinarayana Temple, Talked, District Mysore.— Removal of sand dunes formed around the *Mahadwara* was continued and the broken beams of the *Mahadwara* were streng thened by inserting 'I' section R.S. Joists.

93. Srikantheswara Temple, Nanjangud, District Mysore.— The accretionary brick masonry wall constructed around the Subramanya subshrine was removed and the surface was veneered with stones, matching for the original. The dead mortar on the roof of the pillared *mandapa* was removed and a weather proof course provided in combination with mortar.

94. Parswanatha Basti, Bhatkal, District North Kanara.— The roof of the monument was water-tightened after removing the dead plaster. The floor of the sanctum and the *ardhamandapa* were paved with stone slabs.

95. Chaturmukha Basti, Gersoppa, District North Kanara.— Stone paving was done in the court yard of the temple to prevent stagnation of rain water and the roof water-tightened. Doors were provided to all the entry points for security.

96. Anekal Someswara Temple, Bandalike, District Shimoga.— The southern side of the temple, which had gone out of plumb, was dismantled and reset. (Plates 118, 119).

97. Kedareswara Temple, Belligavi, District Shimoga.— Construction of a retaining wall behind the shed was undertaken to prevent erosion due to the existing irrigational channel.

98. Sultan Bateri, Bolar, District South Kanara.- Protected area of the monument was demarcated and boundary stones were fixed.

Northern Circle

UTTAR PRADESH

99. Agra Fort, Agra, District Agra.— The restoration of obliterated and decayed geo metrical and floral ornamentations encrusted in stucco on the northern wall of the first room of Shish Mahal was carried out with special lime mortar. Convex glass mirrors were fixed in the design work reproducing the original patterns.

Both surfaces of the outer defence wall running from the second bastion at the east side of Amar Singh gate to the eastern facade of Diwan-i-Am, were taken up for repair. Loose stones of red sandstone veneering were reset while decayed ones were replaced with new ones. The decayed masonry work was underpinned and plastered in patches and joints were pointed.

100. Gateway at Pul Changa Modi, Agra, District Agra.— The collapsed roof of the gateway was restored and the light of upstairs made in *kakia* bricks was provided at the north side. The arch at the northern facade was also restored. The southern facade was replastered and cracks on its arch were grouted and underpinned. The worn out brick work of the southern bastion was also underpinned. (Plates 120, 121).

101. Jama Masjid, Agra, District Agra.— Two red sandstone miniature kiosks, one at the north-eastern and the other at the northwestern corner of the ablution Tank in the courtyard were restored. The southern wall of the mosque was replastered. Joints of the red. sandstone lattice railing at the eastern facade were pointed. The red sandstone lattice railing carved out in geometrical patterns was reproduced at places where it was missing on the southern gate and on the eastern facade. The red sandstone perforated lattice screen carved out in floral and geometrical designs was provided at the north-west angle of the sanctuary.

102. Roman Catholic Cemetery, Agra, District Agra.— The eastern collapsed wall of the enclosure was rebuilt with *kakia* bricks and its coping was plastered.

103. Ram Bagh Gate and Compound Wall, Agra, District Agra.— The worn out brick work of walls of the enclosure at the north, south and east sides was underpinned in patches. The eastern facade of the entrance gateway was replastered.

104. Taj Mahal, Agra, District Agra.- In pursuance of recommendations of the Taj Mahal Advisory Committee of 1942, the repair work in the south-western minaret of the Taj Mahal has been resumed. Red sandstones of cyma mouldings on the inner surface of walls and those of moulded soffits and steps of the spiral stairs from the second to the third storey were badly decayed and worn out. They were replaced by new ones. Joints of red sandstones veneering inside the minaret from the bottom to the third storey had been pointed.

The dome of the north-western kiosk of the tomb building was water-tightened by pointing joints of marble stones.

Old wooden doors fixed in the arch of the south facade of the tomb-building were replaced with new ones prepared in the Mughal pattern. The marble plinth of the tomb building had been executed.

The kiosk at the south-western corner of the Taj enclosure was repaired by pointing joints of red sandstones.

Miniature domes of *cupolas* of the marble gallery above the parapet of the main entrance were water-tightened by pointing joints.

The partly collapsed roof and the western wall of the room situated to the east of the south-western corner of Glass House Nursery were restored matching with the originals. (Plates 122,123).

105. Delhi Gateway, Fatehpur Sikri, District Agra.— The pointing of joints in the rubble stone masonry was executed and in order to prevent the leakage of water. A lime concrete ledge was provided to the parapet and roof.

106. Group of Monuments, Fatehpur Sikri, District Agra.— Broken stone brackets and lintel stones of Zanana Rauza were replaced with new ones and old stone slabs of the roof were reset. The work is in progress.

The red sandstone fountain was restored in between Treasury and Diwan-i-Am and its missing stone was reproduced with the design carved out matching with the original.

The conservation of the excavated gateway at the south-eastern side of Mint House was done by edging, pointing and plastering.

107. Gwalior Gate, Fatehpur Sikri, District Agra.— The plinths and bases of pillars of the gateway were underpinned. The portion bulging out, facing to the north-west, was taken out and rebuilt. Joints of the coarsed rubble masonry were pointed. lime concrete floor was provided to the alcoves on either side of the gate. Bulged stones of the *dasa* and verandah were taken out and reset in position.

108. Pathar Garh Fort, Najibabad, District Bijnor.— In order to prevent water percolation in the fortification wall, its southern portion was restored. The top layer was water-tightened.

109. Rani Laxmi Bai Palace, Jhansi, District Jhansi.— The decayed lime plaster on pillars of the northern verandah was removed, they were replastered with fresh lime reproducing moulded geometrical and floral designs matching with the originals.

110. Asaf-ud-Daula's Imambara, Lucknow, District Lucknow.— The repair work of the first and second entrance gateways of the Imambara was carried out. The decayed plaster on

the northern facade of the western wing of the first entrance gateway was removed, replas-tering was done and the restoration of cusped arches, cornices and moulded floral designs was executed. The moulded and carved work of the north-western octagonal kiosk was reproduced. The southern facade of the first entrace gateway was replastered and encrusted designs were restored.

The replaster of the north facade of the eastern wing of the second gateway was carried out with lime mortar. Moulded pillars, niches, cusped arches, pilasters as well as carved designs in stucco, matching with the originals were reproduced. The southern facade was similarly treated with the same kind of work. The collapsed parapet at the southern facade of the western wing was restored with *kakia* bricks up to the height of the miniature domes. The western facade of the western wing was underpinned with *lakhauri* bricks and replastered. (Plates 124, 125).

111. Masjid, Lucknow, District Lucknow.— Repairs of a mosque connected with *Asaf-ud-Daula's* Imambara was carried out. Alterations and additions as made earlier in the mosque were removed and the bastion was repaired and the underpinning was executed harmonizing with the facade of the mosque. The profusely moulded work in plaster at the base of the north-east minaret was reproduced in the original designs. The western side of north-western octagonal kiosk was repaired; trees grown were up-rooted; cavities in the masonry were underpinned and the whole portion was replastered including the moulded designs.

112. Jama Masjid Near Hussainabad, Lucknow, District Lucknow.— Cracks in the ter raced roof of Jama Masjid were grouted and stitched. The decayed, lime concrete of the terraced roof was re-done with fresh lime concrete. The worn out floor of the north-eastern hall was repaired. The decayed lime plaster on walls and pillars was removed, these were replastered, reproducing some profusely moulded geometrical and floral designs matching for the originals. The western and southern facades of the mosque were also repaired, the worn out *lakhauri* brick work of walls was underpinned and replastered and moulded designs carved in stucco were restored at certain places. The rank vegetation on the dome was up rooted.

113. Residency Buildings, Lucknow, District Lucknow.— The western part of the en closure wall of Residency was repaired; it was underpinned and the mouldings on it were reproduced.

114. Rumi Darwaza, Lucknow, District Lucknow.— The worn out *kakia* brick masonry of the south bastion at the western facade of the Rumi-Darwaza was repaired. Pillars, cusped arches and cornices were reproduced. Entire surfaces of western facades of both wings were replastered. Moulded motifs were restored. Decayed moulded calyx decorations and those of frills carved in stucco on the surfaces of both facades of the main arch were restored matching with the originals. The weathered plaster on the piers on the gateway was removed and

re-done. Cusped. arches and moulded geometrical designs carved in stucco on the eastern facade of the southern wing were reproduced up to the parapet. Surfaces of the central and side floors on the second storey were raked out and treated with fine lime mortar. The terraced roof of the southern wing was water-tightened. (Pls. 126, 127, 128 and 129).

115. Radha Ballabh Temple, Brindaban, District Mathura.—Broken and missing *chhajja* stones and richly moulded brackets on the north-east corner and on the north side were restored matching with the originals.

North-Eastern Circle

ASSAM

116. Cachari Ruins, Khaspur, District Cachar.— The work of providing barbed wire fencing to the protected area is in progress.

117. Rock-Cut Sculptures, Gauhati, District Kamrup.— The rock-cut sculptures locally known as Vishnujanardan were cleared of vegetation. The wild trees and herbs growing in the compound were removed and the barbed wire fencing was painted.

118. Duargarila Rock Inscription, Kamakhya **Hill,** District Kamrup.— The wild vegeta tion growing in the compound of the inscription was removed and the area was cleared.

119. Rock-cut Figures, Kamakhaya **Hill,** District Kamrup.— The rock-cut figures were cleared of vegetation. The wild vegetation growing in the compound was uprooted and re moved.

120. Group of Four Maidans, Charaided, District Sibsagar.— The maidans were cleared of vegetation. The wild trees and herbs growing in the compound were uprooted and removed. The area was levelled and dressed for turfing.

121. Group of Monuments, Sibsagar, District Sibsagar.— The monuments at Sibsagar were cleared of vegetation and wild trees were removed from the compound of the monu ments.

NAGALAND

122. Remains of Fort, Dimapur, District Kohima.— The work of providing barbed- wire fencing to the protected area is in progress.

North-Western Circle

HARYANA

123. Firoz Shah's Palace, Hissar, District Hissar.— Buried portions of structures were exposed by removing debris after the excavation. The masonry of the damaged and fallen portions of the Tahkhana were restored. The masonry work was also pointed to match with the original. M.S. railing over which a dwarf wall was provided on either side of the pathway from the entrance.

124. Fort, Hansi, District Hissar.— A drain was provided for proper discharge of rain water from the fort area. Missing and uneven stone flooring of the entrance gate was reset. Restoration of the fallen part of walls of mosque was also done with country bricks matching with the original Joints of brick work were pointed to prevent weathering.

HIMACHAL PRADESH

125. Vajresvari Temple, Chamba, District Chamba.- Slate stone flooring, matching for the original, was provided on three sides of the temple. M.S. grill railing was provided on the northern side for the safety of visitors.

126. Buddhist Monasteries, Tabo, District Lahul and Spiti.— The old decayed beams and rafters of the roof of Lelma Gumpha were replaced by new ones. Besides, mud-bricks were restored.

127. Ardhanarisvara Temple, Mandi, District Mandi.— The ornamental, moulded and sculptured stones of the leaning walls were taken out one by one and were reset in their original position. A proper concrete bed was provided underneath the walls to prevent their subsidence.

128. Trilokinath Temple, Mandi, District Mandi.— A masonry retaining wall on the terrace of the temple was provided from the road side to prevent landslides from the hill slope during rains.

The exposed section of the fallen retaining wall on the river bank was provided with Hessian cloth and painted with coats of coaltar to prevent further landslides, erosion of soil and damage to the temple. Later on, the fallen debris of the retaining wall was excavated and serviceable stones were salvaged.

JAMMU AND KASHMIR

129. Datha Mandir, Bandi, District Baramula.- Debris was cleared to expose the walls of

the temple. Filling and grouting of voids and cavities including pointing of stone work was carried out to the walls of the main shrine and the enclosure walls of the temple, to stop further deterioration.

130. Buddhist Site, Harwan, District Srinagar.— Clearance of debris on the upper terrace and accretionary accumulated materials at the site was effected. Terracotta tiles with orna mental motifs were also exposed outside the apsidal *chaitya-complex.* A temporary Shed for the shelter of watch and ward Staff and for storing the loose tiles was constructed.

131. Ancient Temple, Kakpura, District Pulwama.— Barbed wire fencing fixed to iron posts was provided to stop any encroachments.

132. Group of Temples at Narang, District Srinagar.— Fallen wall on the slope of the terrace of the first group of temples was rebuilt in order to prevent landslides and erosion of soil due to rains and also for the safety of the structure.

133. Madrasa of Akhun Mulla Shah Mosque, Srinagar, District Srinagar.— Fallen and missing brick rubble stone masonry of cells was restored. Fallen arches and pillars of the *madarasa* and matching with the adjacent structures, were also restored. Besides, the cracked and missing vaulted roof was repaired and water-tightened with lime concrete. The main stairs leading to the cells of arcade from the main terrace were also exposed by clearing the debris.

134. Mosque of Akhun Mulla Shah, Srinagar, District Srinagar.— Missing ornamental *devri* stone work on the rear side of *mihrab* of the mosque, with stones salvaged after clearance of debris, was restored as per original.(Plates 130, 131)

135. Parimahal, Srinagar, District Srinagar.— Restoration of stone masonry was done for missing part of walls and bastions on the fifth terrace and its surface pointed in toned lime mortar to match with the original. Reconstruction of baradari on the first terrace was started after dismantling incongrously built walls. Lime concrete flooring, finished with a coat of well-toned lime mortar, was provided in the cells and arcade of terrace.

136. Pathar Masjid, Srinagar, District Srinagar.— Ornamental and moulded plaster of dome ceilings and of squinches was restored after scraping modem cement plaster and modern painted surface. It was provided with toned-lime mortar to match the original. Besides, plain plaster for pilasters and soffits was also provided as per original.

137. Sultan Zain-ul-Abidin's Mother's Tomb Zainakadal, Srinagar, District Srinagar.— Stone and brick enclosure walls were reconstructed on the river side of the tomb to stop trespassing. The damaged sloping terraces of the roof of the tomb were repaired by providing concrete to serve as an impervious layer. The surface was plastered with well-toned lime mortar

and imprints of tile bricks, simulating the original, were provided. The special tiles used in original construction were not available.

138. Dera, Babore, District Udhampur.— Resetting of missing and dislodged stones of the main shrine was completed on the north side. The door-lintel and jambs forming the entrance to the *garbha-griha* was water-tightened.

139. Palace Attributed to Raja Suchet Singh, Ramnagar, District Udhampur.— Dead lime concrete and decayed wooden rafters and planks of the roof of two central *dalans* of the old palace were removed and the roof was reconstructed with new rafters and fresh-lime con crete and a concealed R.C.C. roof slab. The work is in progress.

140. Rana Suchet Singh's Fort, Ramnagar, District Udhampur.— Long vertical cracks in the fortification wall on the north-western corner was opened and stitched with stone-work in lime cement mortar matching with the adjacent stone-work, after removing the rank vegetation which had grown in the cracks. Further damaged walls on the northern and eastern sides of the fort were reconstructed with stones in lime cement mortar. Besides, the wooden bridge on the moat at the entrance was repaired with new wood-work after dismantling the decayed wooden planks and railing.

141. Sheesh Mahal, Ramnagar, District Udhampur.— Dislodged stone-work of the walls of the Sheesh Mahal were rebuilt with stone in lime cement mortar up to the roof level. The work is in progress.

PUNJAB

142. Mughal Sarai, Sarai Amanat Khan, District Amritsar.— Fallen-out and missing brick work on the facade of the house at western-gate was restored up to a height of 5 metres in cement lime *surkhi* mortar. Recessed pointing and edging of fallen plaster was also carried out.

143. Fort, Bhatinda, District Bhatinda.— The work of restoration of bastion No. Sob-3 with veneer of *lakhauri* bricks in lime mortar and mud mortar along with the filling and ramming of core with clay is in progress.

Besides, the sunken portion of the rampart of the southern fortification wall was repaired with brick flooring after filling the earth in the hollows and cavities. A long portion of brick pavement was pointed with cement mortar and fallen patches of brick-work restored with *lakhauri* bricks and lime *surkhi* mortar. (Pls. 132,133).

144. Mughal Sarai, Nurmahal, District Jalandhar.- Damaged brick-work of the house at eastern gate and outer wall of south-western corner of the Sarai were reconstructed with *lakhauri* bricks in cement lime mortar and joints of brick-work were recess-pointed, matching for the original brick-work. (Plates 134,135).

Southern Circle

KERALA

145. Fort St. Angelo, Cannanore, District Cannanore.— The terrace of the horse stables was water-tightened. Underpinning the fort wall after removing the vegetation growth was undertaken and water-tightening the fort wall was executed. The colour was given matching with the original. (Plates 136, 137).

146. St. Francis Church, Cochin, District Ernakulam.— The damaged tiles of the roof were replaced with new ones. Decayed wooden sleepers, beam of the roof were replaced as per the original and painted. The decayed lime plaster was removed and replastered. The doors, windows and the outer walls of the Church were painted as per the original. (Pls. 138,139).

TAMIL NADU

147. Iravataeswara Temple, Kancheepuram, District Chingleput.— The subshrines were provided with gates of iron grills. The earth around the temple complex was removed to expose the hidden features of the basement and later on, uniformly levelled.

148. Kailasanatha Temple, Kancheepuram, District Chingleput.— A wooden door was provided at the eastern entrance of the temple complex in order to prevent unauthorized entry and ensure proper watch and ward.

149. Muktesvara Temple, Kancheepuram, District Chingleput.— The entrance to the temple was provided with a gate of iron grills.

150. Piravatanesvara Temple, Kancheepuram, District Chingleput.— The temple was pro vided with a iron-grill gate.

151. Five Rathas, Mamallapuram, District Chingleput.— Water-tightening the upper tier of the Bhima ratha was completed.

152. Olakanesvara Temple, Mamallapuram, District Chingleput.- The work of under pinning the basement on the eastern side was completed.

153. Shore Temple, Mamallapuram, District Chingleput.- The missing portions of the Balipitha were reconstructed with die stones matching the original.

154. Venkatesaperumal Temple, Tirumukkudal, District Chingleput.- In continuation of the previous-year's work (1982-83, p. 193) reconstruction of the dismantled subshrines is in

progress. The work of reconstruction of *Kalyana mandapa* was completed.

155. Vaikuntaperumal Temple, Uttiramerur, District Chingleput.— The undulated and sunken stone flooring in front of the temple was removed and reset and the joints were pointed.

156. Block No. XXXVI/2 Old Officers Mess, Fort St. George, Madras, District Madras.- The roof was water-tightened with brick *jelly* concrete in lime and two courses of flat tiles were relaid and plastered.

157. Block No. 11/7, Big Ware-House, Fort St. George, District Madras.— The damaged roof was relaid and water-tightened. (Pls. 140,141).

158. Svayambunatha Temple, Kilputtur, District North Arcot.— The work of resetting the dilapidated *mandapa* was completed. The undulated stone flooring was reset and an apron was provided around the temple. The fallen portions of the basement were fixed in their original position with proper binding material. (Plates 142, 143).

159. Cholesvara Temple, Melpadi, District North Arcot.— In continuation of the previous year's work (1982-83, p. 193) reconstruction of the *prakara* wall over a firm foundation was continued.

160. Chandramoulisvara Temple, Nattery, District North Arcot.— In continuation of the previous year's work (1982-83, p. 193) reconstruction of the dismantled walls of the main shrine was completed. The cloister was paved with flagstones over a bad of stone *jelly* con crete and pointed with combination mortar. The out-of-plumb *prakara* wall was reconstructed. The inscribed slabs were reset in their original position. (Plates 144, 145).

161. Rock-cut Cave Temple, Siyamangalam, District North Arcot.— In continuation of the previous year's work (1982-83, p. 194) water-tightening the roof of the *mandapa* was completed.

The out-of-plumb portions of the Ganesha shrine, Subrahmanya shrine and Balipitha were removed and resetted. The roof was water-tightened. A stone basement was unearthed during the clearance work, which could be of *madapalli.* (Plates 146, 147).

162. Fort Vellore, Vellore, District North Arcot.— The work of filling and pointing the wide gaps of the inner rampart wall of the fort, on the eastern and southern side, was com pleted.

163. Jalakantesvara Temple, Vellore, District North Arcot.— The work of water-tightening of the *vimanas* and the *gopuras,* was taken up during this year. Simultaneously the weat-

hered and fallen portions on the top were restored. The tops were plastered with specially hand-ground mortar after filletting and grouting.

164. Monuments at Sittannavasal, District Pudukottai.— The steps were made on a sloppy rock surface for the easy access to the monument.

165. Rock-cut Cave Temple, Kunnakkudi, District Ramanathapuram.— The broken ceiling slabs and beams were replaced with new ones and water-tightening of the roof is in progress.

166. Venkataramana Temple, Gingee, District South Arcot.— The roof of the *Kalyana mandapa* and of the pillared hall were water-tightened with brick *jelly* lime concrete. (Plates 148, 149).

167. Erumbeswara Temple, Tiruverumbur, District Tiruchirapalli.— The work of removing the vegetation growth on the temple and on Tirumadil was completed. Water-tightening of Tirumadil was done by removing the earlier plaster and replastering with combination mortar. The work of removing the moss and lichen accumulation over the *vimana* of the main shrine and Amman shrine was completed. The *gopuras* and *vimanas* were water-tightened. (Plates 150, 151).

South Eastern Circle

ANDHRA PRADESH

168. Raja Mahal, Chandragiri, District Chittor. — The damaged *chajjas* of the three storeyed oblong structure of Raja Mahal in the Lower Fort were repaired by providing granite stone rafters and water-tightened in the two course of flat tiles set in lime mortar and the sur face was plastered in the same mortar. The over hanging corbels were removed by boring. The balcony stones were restored as per original style.

169. Rani Mahal, Chandragiri, District Chittoor.— The extensive cracks that developed in the walls of Rani Mahal were cleaned with water by pressure spray. The loose mortar was removed. The cracks were sealed in paste-clay and a cement liquid was grouted with the help of a hand grouting machine. The existing cracks were stitched with flat iron clamps over which welded mesh was reinforced and embedded in cement mortar. (Plates 152, .153).

170. Charminar District Hyderabad.- The north-east minar of the Charminar was subjected to chemical cleaning and the cavities developed were filled with lime-mortar, matching for the original.

171. Golkonda Fort, District Hyderabad.— The vegetation on the walls of Golkonda fort was removed and dried up roots were burnt with blow lamps. The approach paths from Bala Hissar to Silai Khana, Rani Mahal, Nagar Khana were levelled and murrum was spread and consolidated.

South Western Circle

GOA, DAMAN AND DIU

172. Fort Aguada Sequerdim, Goa.— Two of the breaches in the extensive collapsed rampart walls were reconstructed in conformity with the original. The wide gaps between the original fortification wall and the approach path were filled up in layers with laterite rubble and earth, and consolidated properly. A flight of steps with pipe railing on both sides was provided for access to the beach. Extensive jungle growth and rank vegetation were removed from the upper fort.

173. Bom Jesus Basilica, **Old** Goa.— The pulverized plaster patches on the inner faces of the walls of the church and its ancillary building were scraped off and replastered with lime cement mortar. The walls of the main hall were distempered with pale cream oil bound distemper and the walls of the ancillary building were given shell-lime wash. The rotten members of the doors, windows and ventilators were replaced with new ones and oil paint was given to the wood-work. The weathered laterite stones of the facade were replaced. The modern stalls in front of the church were shifted to the south-west corner to restore the aesthetic beauty of the monument.

174. Lady Rosary Church, Old Goa. — The spongy plaster patches of the inner and outer faces of the walls were completely removed and the outer face of the walls was given a Snowcem wash of ivory shade as a preservative coat and the inner face of the walls was given shell-lime wash. The decayed members of the doors and windows including damaged and missing oxidised fixtures were replaced with new ones and painted with oil paint. The roof was made watertight with the renewal of broken and missing Manglore tiles. The floor of the main hall and of the porch was paved with well-dressed blocks of laterite stones and the joints were pointed with cement mortar as per original. The cracks of the walls and of the arches were grouted with cement mortar and the missing mouldings were reproduced as per original. The collapsed portion of the sacristy in the north-east corner along with the flight of steps of the first floor gallery was restored as per original. The decayed wooden rafters, beams and planks of the flooring of the gallery were replaced with new ones. The approach road and the path around the monument were spread with admixture of murram and red earth. M.S. gates were provided to the west and west-side rear entrance to prohibit the entry of cattle in the premises of the church. (Plates 154,155).

175. St. Assisi Church, Old Goa.— The bulged and spongy plaster patches of the outer and inner faces of the walls were scraped off completely and replaced with fresh-lime cement mortar. The outer faces of the walls were given a Snowcem wash of mid cream shade as a mortar. The outer faces of the walls were given a Snowcem wash of mid cream shade as a preservative coat and inner faces of the walls and the ceiling were given a wash of shell-lime. The damaged doors and windows were repaired and painted with oil paint. The missing and broken Manglore tiles and the panes of the windows were replaced with new ones. The cracks on the walls and the ceiling were grouted with cement and the leakages were arrested. The missing wooden railing of first floor gallery was provided as per original. (Plates 156, 157).

176. Se Cathedral Church, Old Goa.— The spongy and bulged out plaster patches of the outer and inner faces of the walls and of the ceiling was removed completely and replastered. The outer faces of the walls were given a Snowcem wash of ivory shade as a preservative coat and inner faces of the walls and ceiling were given a wash of shell-lime. The different mouldings of the arches of the main altar and of side altars were reproduced in conformity with the original. The north and south portion of the terrace was provided with pressed flat tiles on the bed of cement mortar, and the ceiling was rendered watertight. The decayed and broken doors, windows and the railings were repaired and necessary fixtures were pro vided. All the wood-work was painted with oil paint. (Plates 158, 159, 160, 161).

177. St. Cajethan Church, Old Goa.— The spongy and peeled off plaster patches of the inner and outer faces of the walls and of the rich and delicately carved ceiling were scraped off very carefully and replastered. The outer faces of the walls were given a Snowcem wash of mid cream shade as a preservative coat and the inner faces of the walls were given a wash of shell lime. The mouldings of the facade and of the ceiling were reproduced as per original whereever necessary. The broken and missing Manglore tiles of the roof and panes of the windows were replaced with new ones. The ceiling was made watertight by grouting. The broken, missing, damaged members of the doors and windows were renewed and painted with oil paint. Cement concrete flooring was provided in one of the cells. The missing and broken balustrades of the railing were replaced as per original. (Plates 162, 163).

178. St. Paul Gate, Old Goa.— The spongy plaster patches of the gate was completely scraped off and replastered in fresh-lime mortar and was given a Snowcem wash of ivory shade as a preservative coat. The debris and vegetation around the monument were cleared.

MAHARASHTRA

179. Ajanta Caves, District Aurangabad.— Broken left-hand of Avalokiteswara sculpture (Cave VI) was fixed.

180. Aurangabad Caves, District Aurangabad.— Hands treating the cracks developed

therein. Cracks developed in *Chamara Dharini* Sculpture (Cave VI) were filled up while those in *Saptamatrika* sculpture and *Avalokiteswara* panel (Cave VII) were treated and strengthened by using stainless steel and copper pins.

181. Bibi-Ka-Maqbara, District Aurangabad.— The decayed plaster of western wall and the buttresses of main tomb were removed and redone with combination mortar with *neeru* finish as per the original. The damaged floral decoration was restored in lime mortar with *neeru* finish as per original.

182. Ellora Caves, **District Aurangabad.—** The pedestal of the elephant sculpture (Cave XXXII) was strengthened by using M.S. bars.

183. Kopeshwar Mahadeva Temple, Khidrapur, District Kolhapur.— The area in front of the main entrance was reconditioned by excavating, levelling and dressing and the mouldings were brought to light during the operation. The area in front was fenced by barbed wire with M.S. angles and an entrance gate was also provided.

The modern construction added immediately above the entrance gate was dismantled which was obstructing the view of the temple. The area around the temple was levelled up and sloped properly for laying the flagstone pavement. The gaps between the different course of the *shikara* were properly filled in with brick bats in cement mortar, the same were plastered and toned down to match with the original.

The concrete slab laid on the *swarga mandapa* was dismantled since it was not in conformity with the ancient one. The stones of the hemispherical ceiling of the *mukh-mandapa* were consolidated with cement concrete. The top was rendered watertight and plastered to match with the original.

Western Circle

VADODARA

184. Church of Mohy Jesus, Moti Daman.- In continuation of last year.'s work (1982-83, p. 197), the removal of dead plaster by chiselling it out and providing new cement plaster with *neeru* finish as per the original was completed.

185. Structure Outside the Western Corner of the Fort, Moti Daman.- The dilapidated wall was entirely rebuilt. The work was taken up after digging foundation trenches. The newly-built wall was constructed over a layer of cement concrete and in turn on a filling of boulder and murrum. The foundation, basement and the superstructure were rebuilt in lime cement mortar in rubble masonry. The missing cornice was also refixed with duly dressed and moulded stones as per the original. The top of the wall was watertightend with a layer of lime-cement mortar, using a water-tightening compound. A gate was provided at the entrance. (Plates 164, 165).

GUJARAT

186. Baba Lauli's Mosque, Ahmedabad.— In continuation of last year's work (1982-83, p. 197), providing of roof slabs with layers of brick masonry, in order to prevant percolation of water, was completed. The missing dome was restored along with carvings as per the origi nal. The work of reconstructing the outer side of the *mihrab* with the original carving was completed. The *kanguras* on all sides of the mosque were-rebuilt keeping in view the original size and carvings. The stone flooring inside the mosque was completed on the northern side after laying a concrete bed. While removing the old and dead concrete, a big opening was noticed which was completely filled with earth and debris to prevent carving in future. (Plates 166,167,168,169).

187. Rauza of Azam Khan and Muazam Khan, Vasna, Ahmedabad.— The worn-out plaster on the walls of the Rauza both inside and outside, was removed and after thorough pointing the walls were replastered. It is proposed to take up the work' of flooring and provi ding wooden doors to the monuments.

188. Saiyad Usman Mosque, Ahmedabad.— In continuation of last year's work (1982-83, p. 198) the bulged ashlar masonry of the *jharokha* and on the sides of the graves was dis mantled and reset in lime mortar after replacing the worn-out stones. The four sets of brick masonry steps unauthorisedly built on all the four sides of the tomb were dismantled and new steps of *dhrangadhra* stones were provided.

189. Sidi Mashir's Minars, Ahmedabad.— The monument, popularly known as the Shaking Minars, had suffered damage due to constant shaking and movement of large number of visitors inside. As a result, the basal stones of the southern minar had worn-out. These were carefully chiselled and replaced by new stones as per the original. The missing *Chhajja* and the *kakashasana* in both the minars were replaced. Likewise, the brackets and supports in both the minars were restored with new ones with original decoration. The cornice stones in each storey of both the minars were thoroughly pointed and copper bowels were provided in each stone duly fixed with lead. Mortar was raked out before re-pointing. The new stones were fixed in the sockets made on the top floors of both the minars in order to prevent per sons from shaking the minars. These were deliberately made on the stone in order to have hand hold by persons for shaking the manars. The scaffolding was provided on both the minars for carrying out the work.

190. Devkiji Temple, Dwarka, District Jamnagar.— The heavily-weathered and damaged stone pillars in the *sabhamandapa* of the temple were removed by providing temporarily random rubble masonry supports and replaced by newly carved and dressed stone from the Chorwad quarry. Some of the bases, shaft and other portions of the pillars were also replaced. The liquid mortar (cement: sand : 1 : 1) was injected in the joints of the pillars.

191. Dvarakadhisha Temple, Dwarka, District Jamnagar.- Dressing of the new stones for replacing weathered and cracked old stones of the northern porch of the *sabha-mandapa* was completed. The work of numbering the stones before dismantling the portion to be rebuilt and erection of scaffolding was completed.

192. Trivikramji Temple, Dwarka, District Jamnagar.— The weathered and damaged stones below the *chhajja* portion of the temple were replaced by new stones duly dressed and carved. The stones were reset in mortar and the joints on the outer face were matched in lime mortar consisting of one portion lime and equal portion of dust of dressed stones. The old stones were taken out by cutting and chiselling.

193. Rani Ki Vav, Patan, District Mehsana.— Stones and earth filling inside the step-well was removed. Later on, the exquisitely carved portions of the step-well containing sculptures were exposed. The fallen retaining wall was rebuilt up to a height of 61 cms. (Plates 170, 171)

194. Sun Temple, Modhera, District Mehasana.— The worn-out and cracked stones used in the walls of the *garbhagriha* of the temple were dismantled up to a height of 1.50 metres. The work of replacing the new stones is in progress.

195. Hazira, Danteshwar, Vadodara, District Vadodara.— Some of the cells on the plat form of the mausoleum were plastered and provided with grilled doors in order to prevent misuse of the cells.

196. Tambekarwada, Vadodara, District Vadodara.— With a view to preventing misuse of the open area in front of the entrance to the Tambekarwada, which is located in a crowded locality, the open area of land was provided with a dwarf wall and an iron grill and entry is now regulated through a gate. A small patch of garden has been developed in this area.

RAJASTHAN

197. Fort Wall, Chitorgarh, Disrict Chittaurgarh.— The portion of the fortification wall near Suraj Pole which had collapsed during the monsoon was rebuilt in random rubble masonry using the stones as per the original. (Plates 172, 173).

198. Fort, Jaisalmer District Jaisalmer.— The bulged and decayed portion of masonry on the lower fortification wall near the Nichi pole was dismantled after numbering the stones. The dismantled stones were reset in lime cement mortar. The new stones duly dressed as per the original were used in place of decayed ones. Proper batter and alignment of the wall as per the original was maintained throughout.

The approach road inside the fort between the Hawa Pole and Suraj Poles was repaired. Proper slope and gradient was maintained as per the original. The area in front of the Nichi

Pole has been developed by providing ashlar masonry and enclosed by an iron grill. (Plates 174, 175).

199. Jain Temple Complex, Kishnaganj, Kishan Vilas, District Kota.— The area was cleared by removing the fallen debris. The work of reconstruction of the temple, using the ori ginal members, was taken up and the entire plinth showing different mouldings up to the *adhishthana* level was completed. The flooring of the temple inside and outside was also completed. The work is in progress. (Plates 176,177).

200. Badi Kachahari, Ranthambhor Fort, District Swai Madhopur.— The Badi Kachahari, also known as Hammir's court, was in a bad condition since the roof of the side hall had fallen and the stone slabs used in the ceiling had been dislodged from their original position which were precariously porched and were in danger of falling down. Therefore, supporting pillars of stone set in mud were provided before reconstruction of the roof. Stone slabs were prepared and replaced in the ceiling. Iron bowels were also provided. The work is in progress.

201. Hammir's Palace, Ranthambhor Fort, District Sawai Madhopur. — The vegetation was cleared. The cracked stone lintels were reset and the key stones were fixed using *epoxy* resin. The partition walls of rubble stone masonry which had been provided at a later stage were dismantled and supporting pillars in rubble stone masonry were provided opening the roof from the top and fixing the girders. The work is in progress.

202. Ranthambhor Fort, District Swai Madhopur.— The parapet wall of the Padam Palace had collapsed due to heavy rains and the three main gates of Sat Pole had fallen down. The parapet wall was rebuilt in random rubble masonry and set in lime-cement mortar. The repairs to the main gates of Sat Pole were also taken up. Besides iron girders, wooden doors and windows were provided to Sopari Mahal. The work is in progress.

The half-burnt wooden shutter of the Navlakha gate that had burnt down due to accidental fire, was replaced by the new one.

Monuments Maintained by the States

ARUNACHAL PRADESH

203. Naksaparvat, District East Kameng.— The area with Buddhist relics was provided with a garden.

204. Towang Monastery, District West Kameng.— The conservation work was completed.

GOA, DAMAN AND DIU

205. Sao Pedro Church and Chapel, Panelim, Goa.— Minor repairs and painting were made.

206. Sapta Koteshwar Temple, Narora, Goa.— Major repairs were made.

KARNATAKA

207. Ahmad Khan's Dharmashala, District Bellary.— The veneer slabs of the structure were numbered, removed and reset after raising the sunken foundation. New members were added in places of missing members. The debris inside the well was excavated and the joints of the tomb were pointed with lime mortar. Fresh floor and weather proof course were laid.

208. Nagareshwara Temple, District Bellary.— Coping slab to the parapet wall was pro vided; pointing to slabs and providing a door was completed.

209. Virupaksha Bazar, District Bellary.— The eastern most *mandapa* in the south row of the Virupaksha Bazar was in bad condition. All the fallen members were reset and some new pillars, beams, capitals and roof slabs were added where they were missing. Fresh-lime concrete floor and weather proof course were laid.

Northern *mandapa* is a large pillared hall covered with veneer slab walls on all sides. Replacing the broken beams with the new ones, resetting the veneer slabs and providing new slabs where they were missing, excavation of debris on the floor and providing a new lime concrete weather proof course was taken up. The work is in progress.

210. Ranganathaswamy Temple, Neerthadi, District Chitradurga.— The superstructure of the temple is of granite. Peepal tree which was grown in the joints was removed. All the stone members were numbered and dismantled Using a pully block. After removal and cleaning of vegetation, resetting of the superstructure was taken up. The work is in progress.

211. Kalimasjid, Lakshmeswar, District Dharwad.— The two front minarets were dam aged and were out of plumb, the roof was leaking and some of the cave slabs were dislodged. The leakage was stopped by providing weather proof course and the dislodged cave members were reset. Slanting portion of the mineret was dismantled after numbering every member and reset to the original line.

212. Channakeshava Temple, Hullekere, District Hassan.- The cloistered verandah sur rounding the temple had collapsed at many places and in some portions it had gone out of plumb. This was due to the scooping of the earth and dry stone revetment around the temple. A retaining wall with size stone manonry was constructed. Fallen and dislodged portion of verandah was reset.

213. Raja Tomb, Mercara, District Kodagu.- The roof of the monument was leaking and walls were covered with moss and lichen. The walls were cleaned and a coat of waterproof cement colour was provided. Doors and windows were repaired. Leaking roof was also re-paired.

214. Kalleshvara Temple, Aralaguppe, District Tumkur.— This complex consists of six temples. However, only one is in good condition and all the rest were buried under earth. The accumulated earth around the temples was removed.

MADHYA PRADESH

215. Rani Mahal, District Bhopal.— New terraces were provided matching the earlier. The floors of the rooms were restored and all the doors and windows were repaired. The main entrance gate was also replaced. The electrification of the garden was done.

216. Sheesh Mahal, District Bhopal.— The roof of the Sheesh Mahal was restored, besides repairing the glass panels.

217. Kotravihar, District Rajgad.— The Solankenbha and Durga was fenced after remov ing the vegetation.

218. Beer Singh Deo Makbara, District Tikamgarh.— After levelling the floor of the rooms which were eroded by the river flood, new flooring was provided.

219. Fort Orchha, District Tikamgarh.— The main entrance gate of the fort at Orchha was repaired maintaining the originality.

220. Praveen Rai Mahal, District Tikamgarh.— At Praveen Rai Mahal a new pump set was installed for proper supply of water for the maintenance of the garden. The vegetation was cleared

221. Vanvasi Mandir, District Tikamgarh.— The vegetation was cleared and the direction notice boards were fixed.

222. Lohangi Hill, Vidisha, District Vidisha.- The Lohangi hill bearing both Muslim and Hindu Monuments were properly fenced after the jungle clearence.

223. Mangaladivi Temple, Kakpur, District Vidisha.— The ceiling and the *sikhara* were water-tightened after resetting the stones.

MANIPUR

224. Temples and Samadhis, Imphal, District ImphaL- The vegetation was cleared on the roof and the walls of the Shri Govindajee Temple on the Samadhi of Maharaj Khaba, on the Samadhi of Maharaj Gambhir Singh and on the Gateway at Langthabal.

ORISSA

The conservation of the following monuments is in progress:

225. Sculpture Shed, Ayodhya, District Balasore.
226. Lahiri Temple, Ranipurjharial, District Bolangir.
227. Bhadreswar Temple, Bhadreswar, District Cuttack.
228. Youdhisthira Group of Temple, Dhanisha, District Cuttack.
229. Subarneswar Temple, Sakuntalapur, District Cuttack.
230. Saptamatruka Temple, Sathalapur, District Cuttack.
231. Sculpture Shed, Tirthamath, District Cuttack.
232. Ramapada Temple, Jirabadi, District Ganjam.
233. Batrisa-Simhasana Temple, Nandapur, District Koraput.
234. Buddhanath Temple, Garedipanchana District Puri.
235. Gopinath Temple, Kakudia, District Puri.

RAJASTHAN

Conservation preservation and clearance works were carried out at the following monuments.

236. Bakhtawar Singh Ki Chhatri, District Alwar.
237. Fatehjung Gumbaj, Disrict Alwar.
238. Amber Palaces, District Jaipur.
239. Cenotaphs at Gaitor, District Jaipur.
240. Cenotaphs of Mansingh, District Jaipur.
241. Hawamahal, District Jaipur.
242. Isarlat, District Jaipur.
243. Nahargarh Fort, District Jaipur.
244. Observatory, District Jaipur.
245. Jalore Fort including Topkhana, District Jalore.

246. Temples at Osian, District Jodhpur.

247. Monuments at Mandore, District Jodhpur.

248. Shiva Temple, Keshavrao Patan, District Udaipur.

249. Temples at Nimaj, District Pali.

250. Excavated Remains, Ahar, District Udaipur.

251. Gangobheda Kund, Ahar, District Udaipur.

252. Meera Temple, Ahar, District Udaipur.

253. Ambika Temple, Jagat, District Udaipur.

254. Ramnath Temple Complex, Javar, District Udaipur.

255. Sun Temple, Mandesar, District Udaipur.

256. Vishnu Temple, Iswai, District Udaipur.

WEST BENGAL

The conservation work is in progress for the following monuments:

257. Surya Temple, Sonatapal, District Bankura.

The second phase of reconstruction work of this brick-built magnificent temple is now in progress.

258.Jatilesvar Siva Temple, Purbadaha, District Jalpaiguri.— The foundation of the temple was consolidated. Surrounding area of the temple was properly dressed. Reconstruction of the courtyard and of the high wall surrounding the courtyard was done. The dilapidated 'niche' on the northern wall of the temple was reconstructed matching for the original. The cracks on the temple wall were stitched by the grouting method.!.

259. Pathan Palace, Adina, District Malda.- Reconstruction of the south-west corner 'Minar' at the entrance of the Pathan Palace at Adina was done with 'Rule-pointing' on its exterior surface maintaining its originality.

Treatment of Monuments and Paintings[1]

ANDHRA PRADESH

1. Virabhadraswami Temple, Lepakshi, District Anantapur.— An area of 105 sq. m. paintings in the *Mukha Mandapa* of main Shrine, Ramalingeswara and Vishnu shrine is being taken up for chemical conservation. The preliminary works have already been done.

2. Charminar, Hyderabad, District Hyderabad.— Removal of vegetation growth like Bryophytes, lichens, etc. was carried out chemically using teepol and liquor ammonia on the top of north-eastern minaret. Application of fungicide is to be done after the repair work being carried out by local circle staff.

BIHAR

3. Makhdum Shah's Tomb, Maner, District Patna.—Work of removal of vegetation growths from the exterior of the Tomb and the Gateway was continued from the previous year using liquor ammonia and lissapol. The work was completed with the application of zinc silicofluoride as fungicide. Obstinate black patches were removed using oxalic acid and sodium thiosulphate. (Plates 178,179).

4. Sher Shah's Tomb, Sasaram, District Rohtas.— Gateway and doorway with its side step-walls of this massive monument remained under chemical conservation during the period. The Doorway and its side step-walls were completely chemically cleared and preserved (total area 250 sq. m.) and 76.17% area of the Gateway was successfully conserved chemically using liquor ammonia, acetic acid, oxalic acid, etc. Zinc silicofluoride was used as fungicide.

DELHI

5. Diwan-i-Am, Red Fort, Delhi. — In continuation to the previous year's work, chlorine and sulphate free paper pulp treatment was given for the removal of soluble salts from the eastern wall which exhibited ugly moist patches. After the treatment, entire area was cleaned with plenty of distilled water and was preserved after complete drying with 3% solution of perspex in toluene.

6. Diwan-i-Khas, Red Fort, Delhi.— Removal of dust and dirt, soot deposit and greasy accretions from the plain marble surface and inlay works on the lower portions of the pillars

[1]Information from : 16, Directorate of Archives, Archaeology and Museums, Panaji, Goa; 41,42, 43, Department of Archaeology and Museums, Rajasthan and the rest Director science of the Chemistry Branch of the Survey.

and arches in the northern corridor has been carried out successfully using liquor ammonia, teepol and acetone, etc.

Golden paintings on the arches, under the arches and near the ceiling were covered with thick film of soot, dust and dirt. The careful removal of the accretions was carried out by gently swabbing by cotton using organic solvents like acetone, butyl alcohol, morpholine, etc. Burnishing with satin cloth was followed to brighten the surfaces after the chemical cleaning of entire area, 3% solution of Polyvinyl acetate in toluene was applied as preservative.

7. Zafar Mahal, Red Fort, Delhi.— Outer walls of the Zafar Mahal are under chemical treatment. Muddy accretions and vegetation growths were removed by gently brushing with liquor ammonia-teepol mixture using nylon brushes. Some of the hard muddy accretions were softened first with 5% aqueous solution of acetic acid and were then brushed-off. The work is still in progress.

8. Teen Burji, R.K. Puram, New Delhi.— Eradication of algal growths from the exterior surface of the three domes v/as taken up during the period. The growths were eradicated by brushing with mixtures of liquor ammonia and teepol. The patches of algal growths in the crevices and depressions were removed by picking up these accretions using bundles of small sticks of-coconut brooms. Finally these were preserved with 3% solution of PVA in tolune after applying 1% solution of sodium pentachlorophenate as fungicide.

9. Muhammed Shah Tomb, Lodhi Tomb Complex, New Delhi.— The exterior surfaces of the domes and burjee cornices, etc. of the tomb were taken up for the removal of vegetational growths, imparting a black appearance to the structure. These growths from the central dome and its base portion have been eradicated. The work is in progress. (Plates 180, 181).

GOA, DAMAN AND DIU

10. Bom Jesus Basilica, Goa.— The work carried out in this church includes the following heads:

a) Stone work on the exterior. — Since the original plaster of the wall is reported to have been removed some time before the liberation, the surface was to be preserved as it is. Large patches of thick moss growths, dust and dirt and other accretions were removed using 5% aqueous solution of ammonia with small quantity of teepol.

The cleaning was carried out on the facade containing finely carved columns and panels in basalt, on the entire northern wall, three buttress walls on the northern side and one stone cross at north-east corner. The laterite surface as well as the carved basalt portions were restored to a bright, uniform appearance as a result of the cleaning.

The cleaned surface was treated with fungicide (5% zinc silicofluoride, 2% pentachlorophenate) and finally preserved with 2% polymethyl methacrylate solution.

The total area treated was 2990 sq.m.

b) Gilded areas— The intricately carved and gilded woodwork of the main altar as well as the two subsidiary altars on either sides were cleaned with carbon tetrachloride after dusting with dry soft brushes. Gleaned surface was furnished with a satin cloth. The total area treated was measured 350 sq.m.

In addition to the above, an area of 314 sq.m. in other portions of the church including the Blessed sacrament, pulpit, facade of St. Zavier's mausoleum and a chapel of St. Anthony etc. were also cleaned and burnished.

c) Panel and Canvas Paintings— Twenty-seven wood panel paintings fixed to the wall around St. Zavier's tomb, five large panel paintings mounted above the entrance area and arch of the main altar were cleaned with suitable organic solvents to remove dust, dirt and discoloured old varnish. After cleaning, the paintings were re-varnished using mastic in turpentine base. Some of the canvas paintings in an L-shaped gallery around St. Xavier's mausoluem and inside the sacristy were cleaned after re-lining to give them support.

d) Mural Paintings — A general cleaning treatment was given to the mural paintings on the ceiling of the chamber containing St. Xavier's casket, on the arch inside the sacristy and uppermost part of the wall of sacristy-depicting scenes from St. Xavier's life.

e) Recolouring of Statuary — The image of Christ, angels, etc. on the main altar as well as subsidiary altars were in a pink colour. They were repainted in ivory colours as per the original colour scheme. The dresses of the two large flying angel figures above the transept had been painted in garish pink colour. These have been repainted in light buff colour and their bodies in ivory.

f) Marble work — The marble angel figures in the mausoleum of St. Xavier and the carved marble decorations on the pedestal had turned yellowish due to deposition of dust and greasy matters. Their original brightness was restored by preserving with 1% PVA, after cleaning the total area covered was 60 sq.m.

g) Silver ware — The intricately carved silver casket, silver decorative hangings at the entrance of mausoleum, a beautifully carved silver image of St. Xavier's, etc. in the sacristy had turned quite dark due to the atmospheric action. These were cleaned with the help of 10% ammonia solution and were preserved with 1% perspex solution.

h) Bronzes — Four beautifully fabricated bronze panels on the four sides of the pedestal depicting scenes from St. Zavier's life, were covered with bluish green patches due to corrosion. These were carefully cleaned-with 1:1 formic acid solution to restore their uniform appearance. These are finally preserved with 1% perspex solution.

11. Se Cathedral, Goa.— The gilding on the finely carved main altar as well as on the subsidiary altars needed cleaning. Entire gilded area was first dusted with soft brushes and was then cleaned with carbon tetrachloride. Finally, it was burnished with the help of satin cloth.

The total area treated was 773 sq.m.

A total of forty-one panel paintings and two canvas paintings in the main church were taken for cleaning. The cleaning was done with the help of organic solvents to remove dust and old discoloured varnish bringing out the full details of the design and the original colour scheme. Some small areas where pigment had been lost were filled in with primer and retouched so as to match with the adjoining areas. The paintings were finally re-varnished using mastic in turpentine base.

Inside the sacristy, two canvas paintings were re-lined before they were cleaned, retouc-ched and varnished. On the panel painting in the sacristy, extensive retouching work had to be carried out, following patient and prolonged cleaning for the removal of the thick coat of darkened varnish. A total of twenty-six panel paintings and two canvas paintings were cleaned in sacristy.

Mural paintings, consisting of floral and geometrical designs on the ceiling and arches of the subsidiary altars including the Blessed sacrament were in bad condition, due to the seepage, bulgings and deposition of dust and dirt, etc. The paintings were first repaired by fixing back the bulges and filleting the loose edges. These were cleaned with spirit for removing dust and dirt and brightening up the colours. The paintings were finally preserved with 1% solution of PVA. The total area treated was 298 sq. m.

Fine carvings and statues in basalt on the facade of the church were coated with red ochre altering the original appearance of the stone. The ochre coating was removed with the help of a 2% solution of rustodine and the entire stone surface was then cleaned with 1% teepol solution followed by thorough rinsing with water. After complete drying, the stone surface was preserved with 1% solution of perspex in toluene. The total area cleaned was 302 sq.m.

Two marble fountains near the entrance of the church and a marble statue of Christ in front of the church were also cleaned with 1% teepol solution, to which few drops of ammonia were added. After cleaning, the entire marble surface was preserved with 1% PVA solution. Total area was 37.50 sq.m.

The main altar of the church as well as the altar of the Blessed sacrament, which showed signs of insect activity were sprayed with a solution of pyrethrum in petroleum ether and kerosene. Penta-chlorophenol was also used for injection into cavities. The total area of wood thus treated is 230 sq.m.

12. St. Francis of Assissi Church, Goa.- Of the two paintings, the one hung on the dexter depicting the scene of the last Judgement was in an extremely fragile condition. The canvas had become so brittle and weak that several pieces were found to be detaching from the support. On account of the discoloured varnish as well as the thick deposition of dust and dirt even the subject of the painting was indistinguishable.

Due to lack of time, re-lining of the paintings could not be possible but only repairs to the old canvas could be done with the help of fevicol using electrically heated spatula. After fixing the loose portions, dust, dirt and the discoloured old varnish was removed with the help

of organic solvents revealing the details of the composition as well as the original colour scheme. The painting was finally revarnished.

The gilded surfaces of the main altars as well as subsidiary altars were first carefully brushed with soft brushes and then cleaned with carbon tetrachloride. Great care was taken in the cleaning, both on account of the fragile nature of the gilded surface and the toxicity of the chemicals used. The bare wooden surface of the altars was cleaned with the help of petroleum spirit. The entire surface was finally preserved with 1% PVA solution.

229 sq.m. of carved wooden area in the main church and choir room was also cleaned with petroleum spirit and preserved with 1% PVA. In addition to it, 28 polychrome wooden sculptures were also cleaned and preserved with the same percentage of PVA.

Thirty-four panel paintings in the main church and fifty-nine of the choir room were cleaned and preserved after giving insecticidal treatment, filling up the hole and retouching them. Two canvas paintings in the main church were re-lined and were then cleaned together with one in the choir room. These were finally preserved.

An area of 1129.50 sq.m. of the mural paintings on the ceiling and subsidiary altars and in the choir room was cleaned to remove dust, dirt and old varnish showing ugly patches on some areas. The cleaning was followed by preservation with 1% PVA.

Dust, dirt snowcem splashes and ochre colour patches were also removed from a 36 sq.m. area of decorative stone covering of basalt around the entrance doors of the church on the facade as well as, on a stone statue of the saint at the top of the facade. After cleaning, 1.5% solution of perspex was applied as preservative.

13. St. Cajetan Church, Goa.— Four canvas paintings were taken up in this church. The canvas of the two had become brittle, wrinkled and torn. The paint layer of the paintings was covered with thick coat of discoloured varnish, dust and dirt. The two canvas paintings were re-lined before cleaning. Discoloured varnish layer was removed together with dust and dirt using organic solvents bringing them to their original colour scheme. Two wood panel .pain tings were also cleaned after repair and strengthening at the back using saw dust mixed with fevicol, all insect holes were filled with putty containing insecticide. Retouching was done wherever necessary and the paintings were then preserved.

14. Our Lady of Rosary Church, Goa.— All the carved wooden altars in this Church were covered with thick coat of dust, dirt and greasy matters. The main altar, the two subsi diary altars on either sides and the altar on the dexter with a total area of 136 sq.m. were cleaned with petroleum spirit and preserved with 1% PVA.

15. Treatment of Stone work and Bronze Statuary, Goa.— Viceroy Gate, a laterite structure, with two statues of basalt mounted at the top on either side, the Adil Shahi gate and St. Paul's gate, the pillars and the cross in front of St. Francis of Assissi Church were covered with thick dark growth of moss. They were cleaned with the help of 5% ammonia solution plus 1% teepol solution. After the removal of these growths 2% solution of santobrite was

applied as fungicide and finally preserved with 1.5% solution of perspex.

The two huge bronze statues of Camoes and Albuqurque were covered all over with large greenish blue corrosion patches. Camoes was also disfigured with bird droppings. The statues were first cleaned with 1% teepol solution and later subjected to systematic chemical cleaning with the help of alkaline tartrate solution and formic acid. After the completion of the cleaning and thorough drying, the statues were preserved with 2% PVA solution. The total area of the statues was 65 sq.m.

The bronze statues of Mahatma Gandhi at the traffic circle just outside the church complex was also cleaned since it had been much disfigured due to bird droppings.

16. Forts of Aguada, Reis Magos, Allorna and Chapora, Goa.— Vegetation growth on the walls of the forts of Aguada, Reis Magos, Allorna and Chapora was removed. Nearly twenty-four cannons at Aguada and three cannons at Cabo were subjected to chemical treatment and paint. Similarly, three cannons at Ferry wharf at Panaji and one huge cannon at Miramax, originally belonging to Gaspar Dias Fort were extricated from there and placed on the specially made platforms, after subjecting them to chemical treatment and the paint, at Abade Faria rotunda and Miramar rotunda.

GUJARAT

17. Porbandar, District Junagadh.— Wall paintings on the second floor of the house where Mahatma Gandhi was born were lying covered with lime coats, grease and other blackish accretions. lime coats, from the paintings were removed very carefully by soaking the surface with alcoholic aqueous solution and partially mechanically with great skill and perseverance. Other deposits were removed with the help of selective organic solvents.

18. Tambekerwada, Vadodara, District Vadodara.— Paintings in the main hall on first floor were in poor condition due to pigment flaking, darkening of old preservative and deposition of superficial accretions. Tendency of pigement flaking was first of all arrested wherever necessary then the superficial deposits and old preservative was removed with the help of different suitable organic solvents. Paintings, depicting scenes from Mahabharat were thus rendered visible in their original colours. They were finally preserved with PVA solution in toluene.

HARYANA

19. Ibrahim Tomb, Narnaul, District Rohtak.- The walls and the western side of the dome were chemically treated using dilute ammonia with soft nylon brushes. The greasy deposits were cleaned with teepol diluted with water and the smoke covered area was cleaned with a mixture of triethanolamine in water.

HIMACHAL PRADESH

20. Narbadeshwar Temple, Tirasujanpur, District Kangra.— The paintings on the walls and ceiling of various verandahs and central sanctum were cleaned with a mixture of organic chemicals and reagents. The treated paintings were preserved with 3% solution of PVA in toluene. (Plates 182, 183, 184).

21. Jagatsukh Temple, Manali, District Kulu.— The walls of the temple and loose sculp tures lying in the compound of the Sandhya Gyatri temple were chemically treated.

22. Chilkong Gumpha, Tabo, District Lahaul and Spiti.— The paintings on the walls and the ceiling of the Gumpha were cleaned with organic solvents followed by preservation with PVA solution in toluene.

23. Domlong Gumpha, Tabo, District Lahaul and Spiti.— The paintings on the walls and the ceiling of this Gumpha were cleaned with organic solvents and preserved with 3% solution of PVA in toluene.

24. Chomulong Gumpha, Tabo, District Lahaul and Spiti.— The paintings in this Gumpha had developed cracks. These were filled with plaster of Paris together with an edging of painted surface wherever necessary. This was followed by colour matching.(Plates 185, 186).

JAMMU AND KASHMIR

25. Pather Masjid, Srinagar, District Srinagar.— The inside area of the main gate in the front facade was cleaned with dilute ammonia using soft nylon brushes. The cleaned surface was given fungicidal treatment followed by a coating of 3% PVA solution in toluene as preser vative.

26. Sheesh Mahal, Ramnagar, District Srinagar.— The paintings in Sheesh Mahal had developed huge cracks and bulges at several places. The modelling work was carried out by filling the cracks, edging the painted surface and setting the raised surface of pigments. This work was then followed by colour matching.

KARNATAKA

27. Tipu Sultan's Palace, Bangalore, District Bangalore.— An area of 6.3 sq.m. in south east enclosure was taken up and cleaned during this period. Superficial accretions like dust, dirt, etc. were gently removed using feather brushes. Coats of old varnish and sooty accretions were removed using toluene, diacetone alcohol, cellosolve, triethanol-amine and morpholine

either individually or in combinations. Consolidation of fragile pigments was carried out, prior to chemical treatment. The treated areas were finally preserved with 1% W/V of PVA in toluene.

28. Gomateswara Statue, Sravanabelagola, District Hassan.— During this year an area of 648 sq.m. covering the main statue, the stucco figures, the inscribed slabs, siddharagundu and Tyadada Brahmadeva pillar was taken up for chemical treatment. The work involved the removal of wax-coating, vegetation growths, oily matter and other accretions deposited on the statue due to various unguents used during the *Mahamastakabisheka.* Acetone, toluene, liquor ammonia and teepol were used for the removal of various accretions. The treated areas were then coated with 1% aqueous solution of sodium pentachlorophenate. Finally, these were preserved with 2% w/v of solution in PVA toluene.

29. Srikanteswara Temple, Nanjangud, District Mysore.— A total of 160 pillars (total area 1,232 sq.m.) in the corridor and adjacent *mandapas* of the temple were taken for the removal of oily and sooty accretions in addition to the lime wash applied over a period of time. Teepol, liquor ammonia and acetic acid in water were used for the removal of the above accretions. For the removal of lime wash gentle mechanical methods were also used to eradicate them. The treated area were finally preserved with 2% w/v solution of PVA in toluene.

MADHYA PRADESH

30. Vishnu Temple, Janjgir, District Bilaspur.— Eradication of vegetation growth and lime wash from the *jagati* of Vishnu temple was made with 2 to 3% solution of liquor ammonia mixed with non-ionic detergent. The work is still in progress.

31. Kandariya Mahadeo Temple, Khajuraho, District Chhatarpur.— The *Ardh Mandapa* and *Mandapa* of the temple were taken up for the chemical cleaning which included the removal of vegetation growths together with lime wash on a considerable area. Liquid am monia solution was used together with teepol to eradicate moss and lichen while 1 to 3% aqueous solution of acetic acid was used to remove lime wash. After cleaning the entire area was given a treatment with 2 to 3% sodium pentachlorophenate as fungicid and preserved with 3 % solution of PVA in toluene.

32. Laxmana Temple, Khajuraho, District Chhatarpur.— The *Ardh Manadapa* and *Mandapa* in this temple were given the treatment of dilute aqueous ammonia with teepol to eradicate moss and lichens and dilute 2% acetic acid for the removal of lime wash. The work is still in progress.

33. Bhoj Shala, Dhar, District Dhar,— Removal of lime wash and vegetation growths were taken up and a major part of the work has been completed during this year. The work is still in progress.

34. Bagh Caves, Bagh, District Dhar.— Relative humidity was noted and fumigation of various cells, removing dust and dirt and fungus growth, wherever necessary, was done at Cave numbers 2, 3 and 4. A periodical insecticidal treatment was given to protect the stripped pieces of paintings of Cave No. 4 from impounding dangerous rats, termites, etc. Eight sculptures in the *garbhgribha* were consolidated by modelling and strengthening them.

35. Bahu Temple, Gwalior Fort, Gwalior, District Gwalior. — Removal of dust, dirt and growths of micro-organisms was done using dilute liquor ammonia mixed with teepol and 2% acetic acid.

36. Main Stupa No. 1, Sanchi, District Raisen.— Railing and gateways of Stupa no. 1 were covered badly by a thick layer of moss and lichen and other micro-organism. It was removed with 3% aqueous ammonia and non-ionic detergent solutions.

MAHARASHTRA

37. Ajanta Caves, Ajanta, District Aurangabad.— On the ceiling of the antechamber of Cave No. 2, a longitudinal crack had developed causing flakings of pigments and bulging the plaster at several places. A number of holes had also developed due to insects. These defects were removed by using plaster of Paris mixed with fevicol. Later on, colour matching was also done.

Bulgings on the north-east wall of the Buddha Chamber in Cave No. 6 and 16 were fixed back, using Japanese tissue paper and cellulose sheet for wetting to soften and injecting PVA solution in toluene or fevicol mixed with plaster of Paris into the cavities. Bulging surfaces were carefully pressed till the adhesion was complete. Colour matching was done wherever necessary.

Copper nails, applied half-a-century back in the paintings of panels 9 and 10 on the east wall of Cave No. 17 were removed with great skill. The areas around the nails were wetted before pulling them out. The gaps thus caused were filled-in with a mixture of fevicol and plaster of Paris. Filleting on pillar 6 was also done. (Plates 187, 188).

Drawing and documentation was carried out before undertaking the above mentioned work. Removal of dust and other accretion was done on panel 11 and pillars 6 and 10 facing the west wall in the Cave No. 17.

38. Nandi Mandapa, Cave 16, Ellora, District Aurangabad.— Beautiful hidden paintings were discovered on the walls of *Nandi Mandapa* of Cave No. 16. The paintings resemble that of Ajanta in many respects. Consolidation of bulgings and flaking on the paintings on the exterior of the cave was done by using a mixture of plaster of Paris and fevicol.

39. Bibi-Ka-Maqbara, Aurangabad, District Aurangabad.— The wooden doors of this Maqbara are covered with metallic plates containing designs which were covered with greasy

accretions due to constant touch of the visitors and also affected by atmospheric corrosion. The chemical cleaning of these metallic plates was taken up this year. These brass doors were cleaned by using chemicals like sodium potassium tartrate, sodium hydroxide, citric acid, teepol and other organic solvents.

ORISSA

40. Jagmohan of Raja Rani Temple, Bhubaneswar, District Puri.— The chemical clea ning by using 1% to 2% aqueous ammonia, 5% polycid and dilute oxalic acid, was conducted on the *jagmohan* of Raja Rani temple. The entire cleaned area was subjected to fungicidal treatment with 1% zinc silicofluoride and finally preserved with 1% perspex solution in toluene. The work has been completed.

41. Lord Jagannath Temple, Puri, District Puri.— Chemical treatment for the removal of lime plaster from the exposed portion of vertical walls of the *vimana* of Lord Jaganath temple was carried out, using 2 to 5% dilute acetic acid. Some of the areas were cleaned with lissapol. Some areas were subjected to fungicidal treatment followed by the application of preservatives.

The upper portion of the vertical walls facing east, south and south-west were also subjected to chemical treatment for the removal of lime layers of different thickness with 1 to 5% vinegar solution. The original colour and texture of the sculptures and designs were restored after the chemical cleaning. (Plates 189, 190).

RAJASTHAN

42. **Chitra Sala, Chhattar Mahal, Bundi, District Bundi.—** The painted plaster, found peeling off or bulging out from the wall surface, was fixed back to the wall support with the help of plaster of Paris mixed with fevicol. Strengthening of painted plaster and broken edges of paintings was done by filleting and filling of cracks was also carried out.

43. **Monuments at Jaipur, District Jaipur.—** The work of the restoration at Sheesh Mahal inside Amber Palaces, Jaipur, was undertaken by the department. Black staining caused as a result of biodeterioration was cleaned. Cracks and gaps developed on the roof of the Ganesh Pole (Suhag Mandir) of the palace were filled and repaired. Eradication of vegetation growth was effected by the help of injecting the shrex tree killer. Roof of Sheesh Mahal was given a coating of black Rubber paint for preventing the seepage of water. Wall paintings existing at the cenotaph of Raja Man Singh at Amber, Jaipur, were chemically preserved. The Cenotaph of Sawai Madho Singh Ji at Gaitore, Jaipur, was treated against the black staining caused as a result of rain and biodeterioration.

44. Paintings, Government Museum, Jhalawar, District Jhalawar.— Thirty oil paintings

of the Government Museum, Jhalawar were given conservation treatment as these were damaged by termites.

45. Paintings, Government Museum, Kota, District Kota.— Twenty miniature paintings of the Government Museum, Kota were provided with preservation treatment.

46. Badal Mahal, Kumbhalgarh, District Udaipur.— Removal of dust, dirt and pencil marks over the paintings was carried out by using suitable organic reagents. At some places painted surface was fixed and consolidated with transparent resin solution. This was followed by their preservation which restored the original bright colour of the paintings.

47. Sas-Bahu Temple Complex, Nagda, District Udaipur.— Stone sculptures and carvings in the ceiling, brackets and pillars of *sabha-mandap* were cleaned by using mixture of ammonia with teepol and lissapol. The cleaned sculptures were strengthened and consolidated with a preservative solution.

TAMIL NADU

48. Kailasanatha Temple, Kanchipuram, District Chingleput.— The work of exposing Pallava paintings in the cells on the rear side of the temple was continued in cells 30, 31, 33 and 34. The plaster was first removed by careful chiselling followed by chemical cleaning to remove lime and then to brighten up the paintings. Some beautiful paintings were revealed.

The chemical cleaning and preservation of the main *vimana* was undertaken. The stone was covered with thick growth of moss and lichen. These growths were removed by using teepol, ammonia mixture and dilute acetic acid. After thorough cleaning a fungicidal coating was given followed by a preservative coating of PVA in toluene.

49. Vaikunthaperumal Temple, Kanchipuram, District Chingleput.— The paintings were chemically cleaned, consolidated and preserved. Some beautiful designs and one small figure have come to light after the treatment.

50. Arjuna's Penance, Dharmaraja Ratha and Bhima Ratha, Mahabalipuram, District Chingleput.— Small patches of vegetation growth on the sculptures were chemically cleaned using teepol ammonia mixture. A fungicidal coating was then given followed by a coating of PVA.

UTTAR PRADESH

51. Taj Mahal, Agra, District Agra.- The small arch of the Taj at north-west was covered with hard brownish accretions. The normal chemico-physical methods were found to be unsuitable therefore, the absorption phenomenon was employed for the purpose. A paste

prepared by mixing 100 gms. magnesium trisilicate, 2 ml concentrated ammonia, 1 ml teepol, 1 ml $H_2 O_2$ and 2 drops of triethanolamine, was applied to the portions for overnight and washed with cotton swabs using distilled water. The entire effected area was thus cleaned.

Black patches of algal growth, deposit of dust, dirt, oil, soot and other greasy accretions were removed from the marble railings, marble slabs, and marble screen of the northern peripheral wall by using soft brushing with ammonical water, non-ionic detergents, hydrogen peroxide and triethanol amine. Finally the surfaces were thoroughly washed with distilled water.

Brownish deposits of greasy matter together with dust and dirt on the south and west peripheral walls of the Taj and stairs leading to the upper platform of the Taj were removed by using organic solvents like toluene, acetone, triethanolamine, etc. Hard blackish deposits of dried algae were removed with the help of non-ionic detergents, ammonical water and hydrogen peroxide.

52. Dewan-I-Khas, Fatehpur Sikri, District Agra.— The removal of dust, dirt, bats excreta, soot and oily accretion was carried out and, thereafter, treated with 1% zinc silicofluoride followed by a coat of 2% PVA solution in toluene as a preservative.

WEST BENGAL

53. Shyam Rai Temple, Bishnupur, District Bankura.— Removal of moss and lichens over the beautiful terracotta figures was done by using liquid ammonia, triethanol amine, acetic acid, zinc silicofluroride, etc.

54. Jore Banglow Temple, Bishnupur, District Bankura.— Eradication of moss, lichen and lime wash from the terracotta figures of this temple was done by using liquor ammonia, triethanolamine, lissapol and other non-ionic detergents. The treated area was preserved with PVA in toluene after giving a fungicidal treatment.

55. Bhutan.— A five-member team of Indian archaeologists visited Bhutan in October 1983 to undertake a pilot project for the conservation, restoration and documentation of murals in Bhutan. In the first phase, the team chemically cleaned, consolidated and preserved the paintings in Hamtongsa in Wangdiphodrang Dzong. The paintings were executed and preserved on mud plaster except in one place. It was executed on cloth fixed to the mud plaster. There were extensive cracks and bulgings. Cleaning was done by using solvents like methyl alcohol, cellosolve, triethanolamine spirit, etc. Bulgings and cracks were consolidated by using tinted plaster of Paris. Colour integration was done to give an uniform appearance and paint ings were finally preserved using 3% PVA in toluene.

The Urchi in the Wangdiphodrang Dzong was having big cracks in many places. The Royal Bhutan Government wanted to make structural repairs, replacing the wooden ceiling and flooring to enlarge the prayer hall together with the preservation of the paintings on the top two

prayer halls viz. Ghongkong and Lamhaka. The paintings were on cloth fixed to mud plaster They were first documented and then the facing was given using cloth and PVA. Thereafter, the paintings were carefully detached. The detached paintings were carefully stored and will be fixed back in their original position as soon as the building is ready. After detachment, some paintings executed on mud plaster were found in the Ghongkong and these were also detached. About 120 sq. mt. paintings have been detached.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS[1]

56. Ten flags, three antiquities, nineteen photographs from the Indian War Memorial Museum, Delhi were preserved.

57. Twenty miniature paintings and ten glass paintings from Madhya Pradesh Govern ment, Indore were preserved.

58. Excavated antiquities of copper and iron, and coins from excavations at Hulas were cleaned and preserved.

59, Excavated objects of gold, silver and copper from the excavations at Sringverpura were cleaned and preserved. (Plates 191, 192).

60. Canvas paintings and flags from Rajaputana Rifles and copper objects from Kali-bangan were cleaned and preserved.

61. Selected exhibits for the new Museum at Hawa Mahal, Jaipur were provided with suitable conservation treatment. Amongst them, 17 stone sculptures, two copper plate inscrip tions, a poly-chromed wooden sculpture, an earthern water pot, one gilded hide shield, some ornaments, three miniature paintings coins and inscriptions are worth mentioning.

62. For setting up a new Musuem at Jaisalmer thirty-two stone sculptures, two inscri ptions, two miniature paintings, thirty-eight coins, seven musical instruments, twelve puppets, an artistic wooden box were given chemical treatment.

63. The excavated copper material from Ganeshwar (Sikar) was chemically treated and preserved.

Research and Analysis[2]

64. Petrological research on stone images was carried out. Research on chemical com-

[1] Chemical treatment carried out by : 56-60, Science Laboratory, Dehra Dun of the Survey, 61-63, Department of Archaeology and Museums, Rajasthan

position of coins belonging to the pre-Gupta period Gupta period, and post-Gupta period and also Metallographical studies of these coins were carried out.

65. The Science Branch of the Survey took up extensive researches on the possible adverse effects of gases and particulates on the standing cultural heritage located in Agra, Mathura Region. The researches involved the following considerations—

1. Analytical background of marble and sandstone, the two building materials which are extensively used by our ancestors, and weathering processes associated with them.
2. Study of alteration of minerals in the stone.
3. Study of the surface enrichment phenomenon with the help of SEM, SEI, BSEI, etc.
4. Background of Agra, its foundaries, other sources of emissions, their usual effect and participation in causing the damage.
5. To monitor the concentration levels of So_2, sulfation rate, particulate matter, and its complete analysis.
6. Meterological-parameters: wind velocity, direction, rainfall, Relative Humidity, temperature were measured under different conditions.
7. Evaluating the cleaning techniques.

Efficacy of different preservatives based on varied chemical formulations *in situ* and under varying concentration of pollutants and about 90±5% of RH under RT was carried out. Very often a question is raised about the stained pattern found in marble, it is a natural ingredient due to the presence of trace of impurities like graphite, manganese, iron etc.

The marble has become slightly yellow due to natural weathering, deposition of aerosols, particulates, carbonaceous matter and pollutants in ambient air. This yellowishness is superficial and in many cases, has been removed by physico-chemical means. While in a few areas, it is difficult. New technique of Attapulgite clay-pack has furnished the best results. The clay-pack mixed with the solvents and applied in packs on the surface to be cleaned, act efficaciously to extract the unwanted substances. This material is inert and has a chained structure.

Thus, as a result of these researches, several new points have come to light: 1) the concentration level of sulphur di-oxide is maximum during winter, 2) 90 to 99% of total inorganic insoluble matter consisting of silica metallic particulate, flyash, mica, etc. are present while the volatile matter range from 18% to as high as 13.23% indicating the presence of organic matter like soot, tarry matter as well as sulphur, and 3) Rain analysis revealed the neutral character of water. It is interesting to see that the analysis revealed traces of iron, alumina, calcium, lead, magnesium.

Wet analyses of mortars, plasters, metals or alloys, marbles, soil, pigments were carried

[2] Information from : 64 : Department of Archaeology and Museums, Government of Gujarat; 65 and 66 : Science Branch of the Survey.

out. Physical properties like porosity, specific gravity, pH, hardness, permeability, etc. were also found out.

66. A new section on anatomical studies, identification and preservation of ancient woods has been established.

67. A section of ancient textile fibres and paper material was also opened, and samples from different parts of the country were collected.

ARCHAEOLOGICAL GARDEN[1]

BIHAR

1. Ancient Relic Stupa, Vaishali, District Vaishali.— A garden around this important Buddhist monument and providing irrigation for this garden is in the planning stage.

GUJARAT

2. Hazira Tomb, Vadodara District Vadodara.— The landscape around tomb of Shah Alauddin, tutor of Jahangir, has been developed. After going through preliminary horticultural operations at this site, water connection from the Municipal Corporation of Baroda has been obtained. A nice garden is coming up fast around this site.

3. Excavated site and Museum at Lothal, District Ahmedabad.— A garden most suited to the topography of this site has been laid out. Efforts are in progress to have a perennial source of water.

4. Step well at Adalej, District Gandhinagar.— Land around this archaeological site measuring approximately 2.5 acres have been developed by laying out lawns, shrubbery border and dot plants.

JAMMU & KASHMIR

5. Shankaracharya Temple, Srinagar, District Srinagar.—The famous shrine related to Adi Guru Shankracharya having about 1.5 acres of land has been landscaped by introducing sacred plants.

ORISSA

6. Megheshwar Temple, Bhubaneswar, District Puri— Garden befitting this temple has been laid out making it more attractive.

7. Sun Temple, Konarak, District Puri. — The existing garden has been enlarged by

[1] Information from Chief Horticulturist of the Survey which maintains nearly ninety archaeological gardens. Important works carried out during the year under review are included here. Information on item 12 received from the Director, Archaeology and Museum Government of Rajasthan.

taking 26 acres of land covered by sand dunes. The acquired area has been partially fenced, paths have been laid and new plants have been introduced.

PUNJAB

8. Archaeological Fort at Bhatinda, District Bhatinda.— The available land of 5 acres in this fort has been grassed and appropriate dot plantations arranged.

RAJASTHAN

9. Fort complex, Chittorgarh, District Chittorgarh.— The area within the famous archaeological fort at Chittorgarh is being brought under gardening in a phased manner. New gardens around the important sites at jaimal Patta house, Suraj Kund, Kirti Stambh, *Sati* Complex and Avadh Nath temple, covering an approximate area of 4 acres, have been laid out.

10. Jaleb Chowk, Amber, District Jaipur.— Gardens on the Mughal pattern were developed at Jaleb Chowk, Jaipur. The gardens inside the palaces at Amber, and the gardens at Jantar Mantar, were maintained.

UTTAR PRADESH

11. Aram Bagh, Agra, District Agra.— The famous resort of the first Mughal emperor Babur known as Aram Bagh across the Yamuna at Agra has been thoroughly excavated in order to trace the ancient remnants and linking garden. In this effort 5 acres of area have been remodelled in Mughal style.

PUBLICATIONS

Publications of the Survey

1. Ancient India.— Numbers 5 to 8 have been reprinted. Number 9 and 10—11 have been sent to the Press for reprinting.

2. Indian Archaeology—A Review.— The issue for 1982—83 is in the final stage of printing and the issue for 1983—84 is being made ready for the press.

3. Epigraphia Indica.— Volumes XIX to XXVI have been reprinted and volumes XXVII and XXVIII are in the Press. Volume XXXIX, Part HI to V have been printed. Parts I to VII of Volume XL are in the final stage of printing.

4. South Indian Inscription.— Volumes XXI, XXII and XXIV are in the final stage of printing.

5. Annual Report of Indian Epigraphy.—The issue for 1973—74 has been printed.

6. Eprigraphia Indica-Arabic and Persian Supplement.— The issue for 1976 has been made ready for the press.

7. Memoirs of the Archaeological Survey of India.— Memoir No. 78, part II, Lothal is in the final stage of printing. Memoir No. 81. Images of Nepal, has been printed. Excavation Report on Satanikota has been sent to the press for printing.

8. Inscription of the Paramaras, Chandellas, Kachchapaghat, and Two Minor Dynasties.- Part III of volume VII is in final stage of printing.

9. Guide Books.— Ajanta by D. Mitra and Hampi by D. Devakunjari have been printed. Guide to Sanchi, Chola Temples, Bhubaneswar and Sarnath have been sent to the Press for reprinting.

10. Picture Post Cards.— Black and white picture postcards of Belur, Mandu, Somnathpur and Nagarjunakonda were brought out, and a colour set on Sanchi is at the final stage of printing.

Other Publications

Himachal Pradesh.— The Department of Languages and Culture, Government of Hima-chal Pradesh, reproduced ten Pahari paintings and published them for sale.

Karnataka.— Directorate of Archaeology and Museums, Government of Karnataka, brought out the following publications:

Vijayanagara — Progress of Research 1979-1983;
Dasara Souvenir 1983; and
Picture Post Cards of Mysore Palace.

Madhya Pradesh.— The Directorate of Archaeology *8c* Museums, Bhopal, has brought to light the research journal 'Puratan', a quarterly issue, and the following monographs on 'Rehli Sun Temple' by G.L. Raikwar, 'Bhoramdeo Temple' and 'Gondkalin Ramnagar' by G.K. Chandrol, 'Bouddha Bangmoy me Nari' by Smt. Kamal Dafal, 'Gwalior Fort' by K.K. Chakravarty, and 'Rock Art of India' a proceeding of the International Seminar edited by K.K. Chakravarty. Indian Art book on 'Orchha' and 'Khajuraho' by K.K. Chakravarty are in the press.

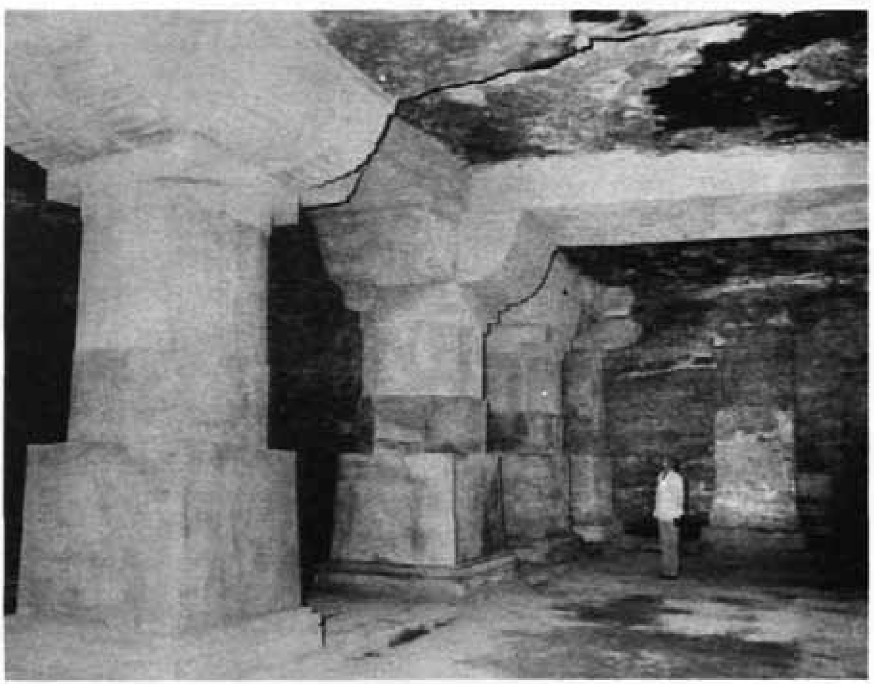
Posters on the Bimbetka rock Shelter, Bhoramdeo Temple, Kskith Vasana; An Image of Jabalpur Museums and 'Panels of Orchha paintings' were published.

Rajasthan.— The Directorate of Archaeology and Museums, Government of Rajasthan, brought out research articles on Rajasthan's early cultures, monuments, sculptures and exca-vations. "The Researcher" an official bulletin of the department was sent to the press.

West Bengal.— A Seminar on 'Archaeology in West Bengal' was arranged by the Directo-rate of Archaeology, Government of West Bengal at Calcutta, in the last week of April, 1984. A brochure was published on this occasion.



96 Bagh Caves : General view of the row of Decayed pillars in Cave 2. before conservation. *See page 205*



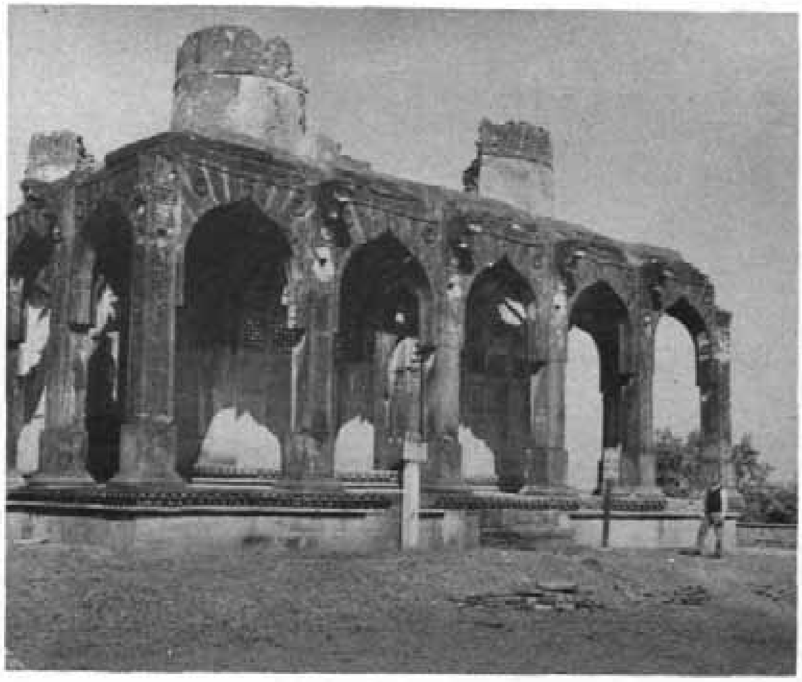
97 Bagh Caves : General view of the Row of Decayed pillars in cave 2. after conservation. *See page 205*



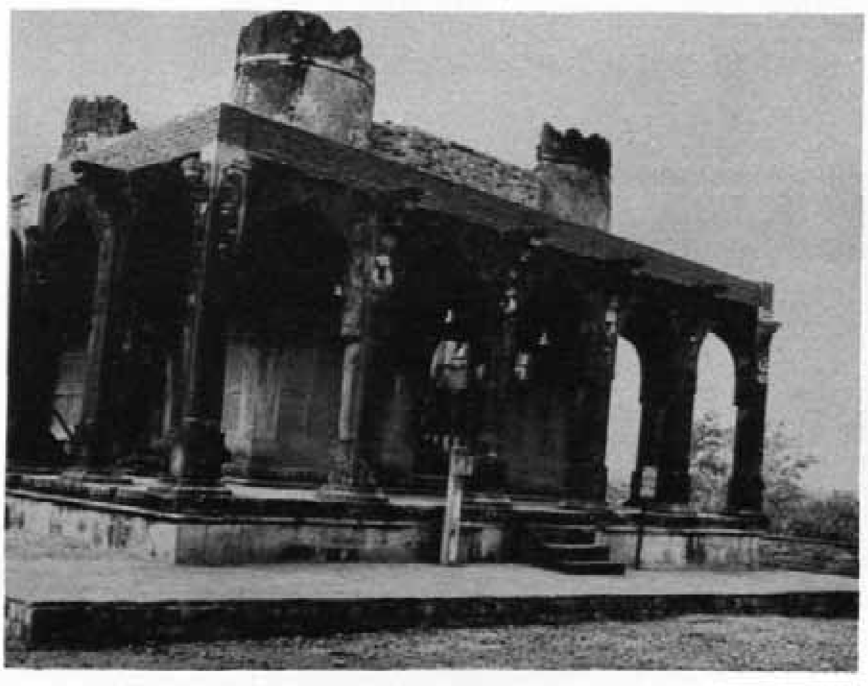
98 Burhanpur : Close-up view of Hammam before conservation. *See page 206*



99 Burhanpur : Close-up view of Hammam after conservation. *See page 206*



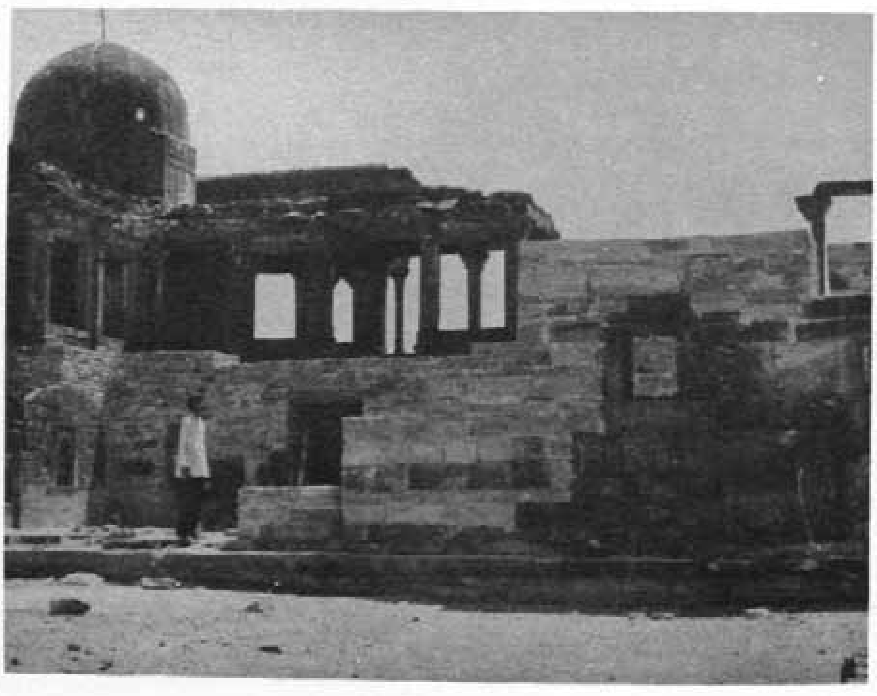
100 Chanderi : Side view of Bada-Madrasa before conservation. *See page 206*



101 Chanderi : Side view of Bada-Madrasa after conservation. *See page 206*



102 Raisen Fort : Close-up view of Jinjhari Mahal before conservation. *See page 207*



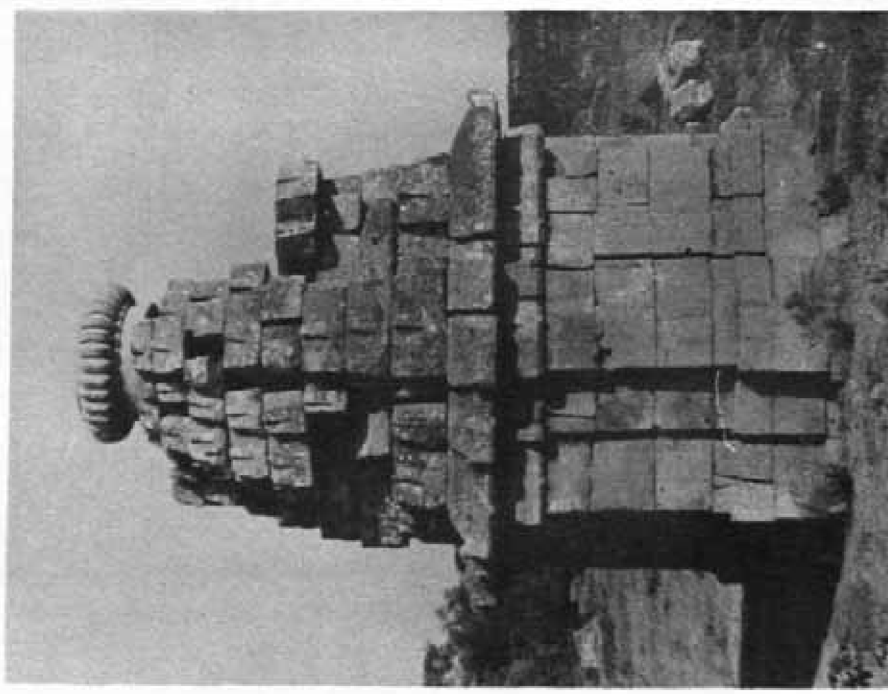
103 Raisen Fort : Close-up view of Jinjhari Mahal after conservation. *See page 207*



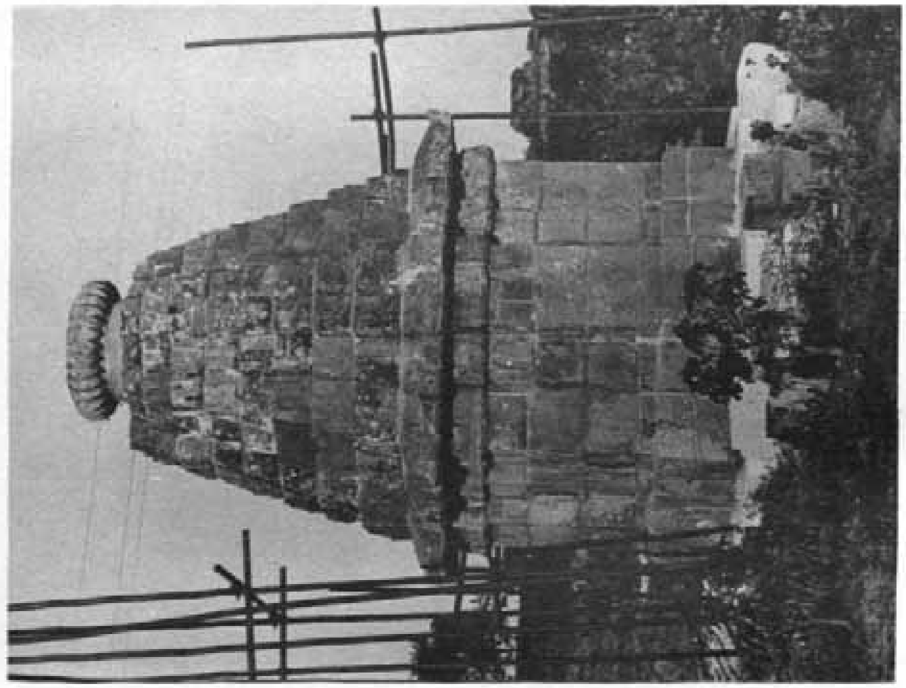
104 Badoh Pathari : Back view of Jain Temple before conservation. *See page 208*



105 Badoh Pathari : Back view of Jain Temple after conservation. *See page 208*



106 Bhubaneswar : Subsidery temple in Bhubaneswar temple compound before conservation. *See page 209*



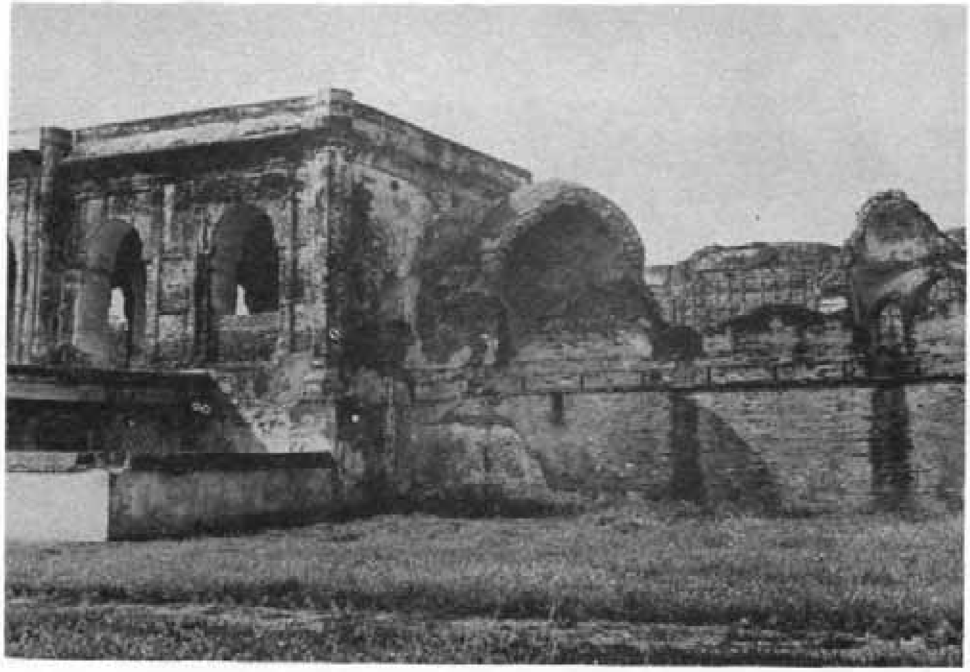
107 Bhubaneswar: Subsidery temple in Bhubaneswar temple compound after conservation. *See page 209*



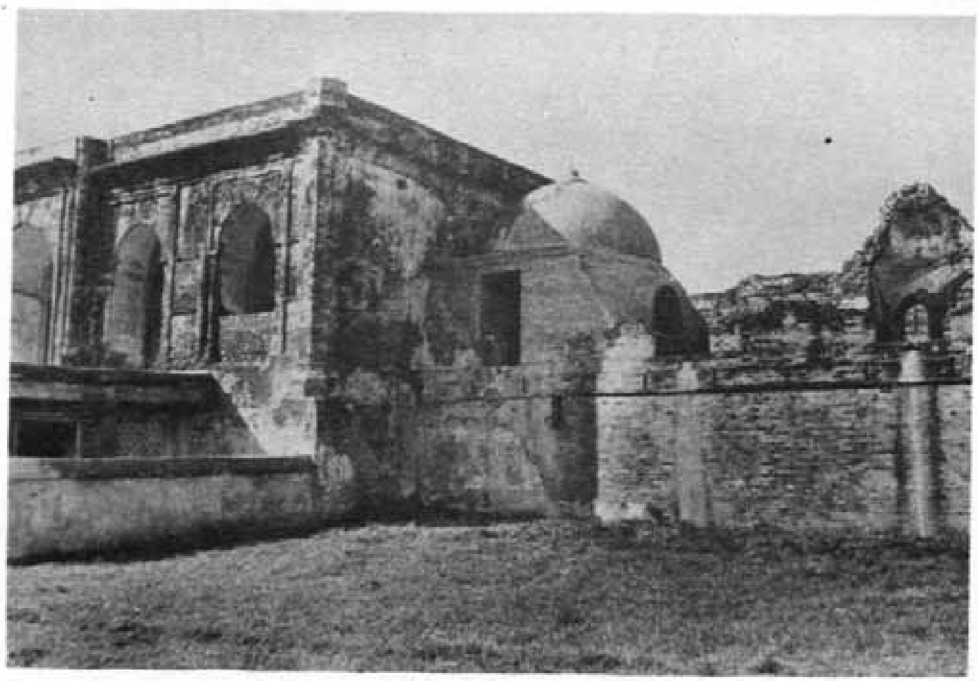
108 Adina: Two arches inside Adina Mosque in east before conservation. *See page 210*



109 Adina : Two arches inside Adina Mosque in east after conservation. *See page 210*



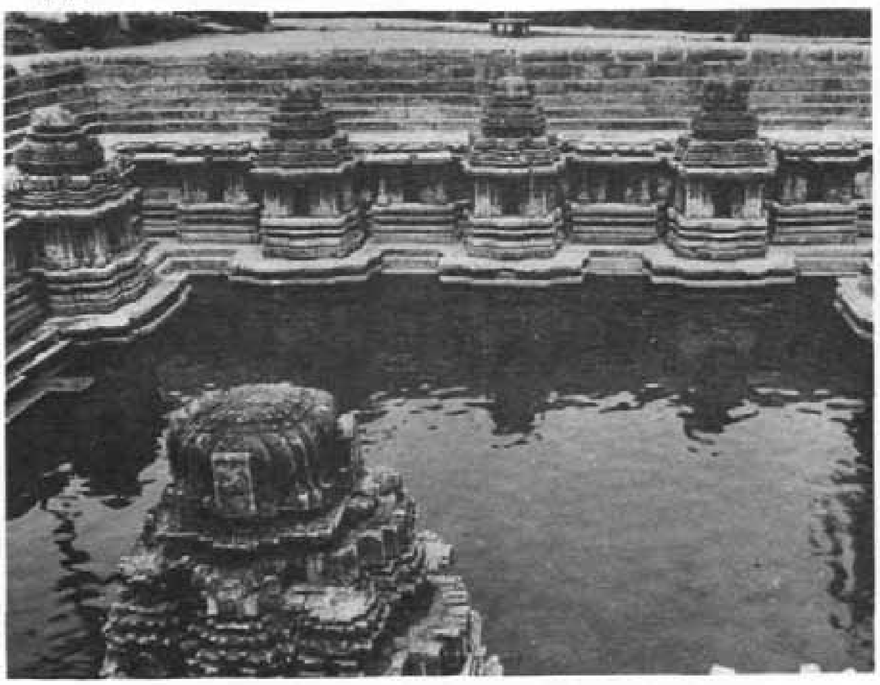
110 Katra : Dome of Katra mosque of east before conservation. *See page 210*



111 Katra : Dome of Katra mosque of east after conservation. *See page 210*



112 Hulikera : View showing the northern Wing of Kalyani before conservation.
See page 214



113 Hulikera : View showing the northern Wing of Kalyani after conservation.
See page 214



114 Hulikera : View showing the western wing of Kalyani before conservation.
See page 214



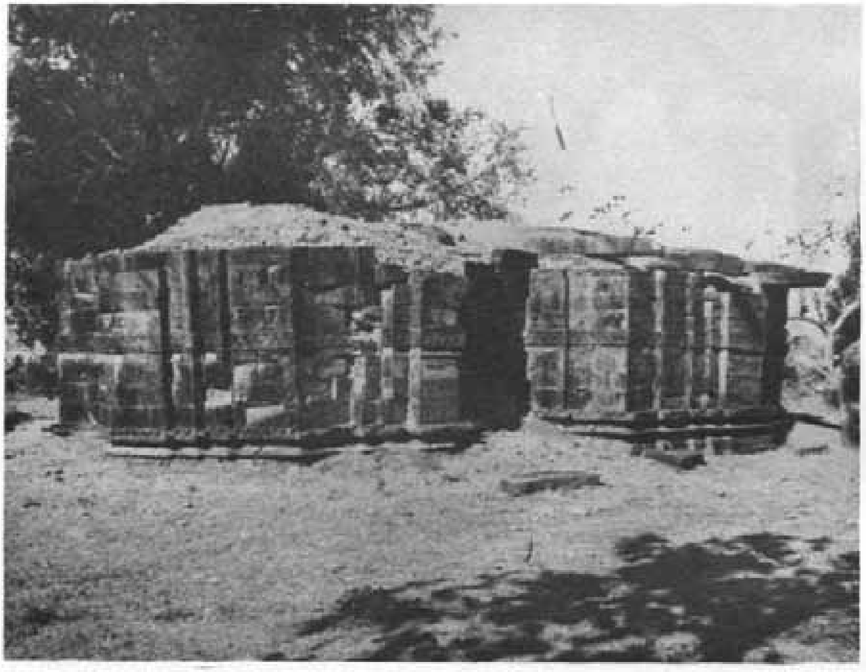
115 Hulikera : View showing the western wing of Kalyani after conservation.
See page 214



116 Basral : General view of the entrance *Mandapa* of Malikarjuna temple before conservation. *See page 215*



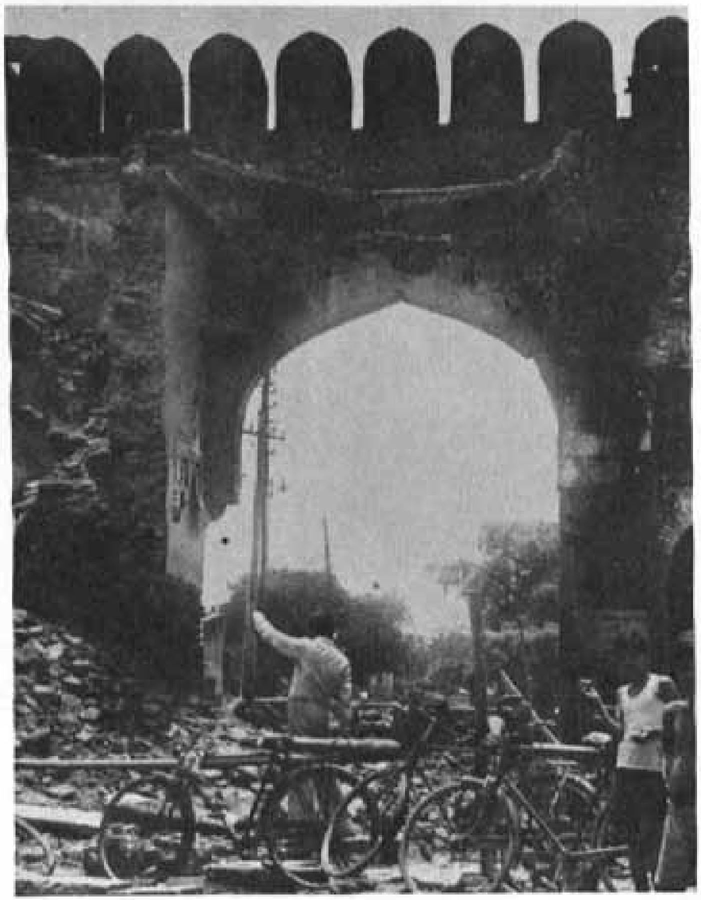
117 Basral : General view of the entrance *Manadapa* of Malikarjuna temple after conservation. *See page 215*



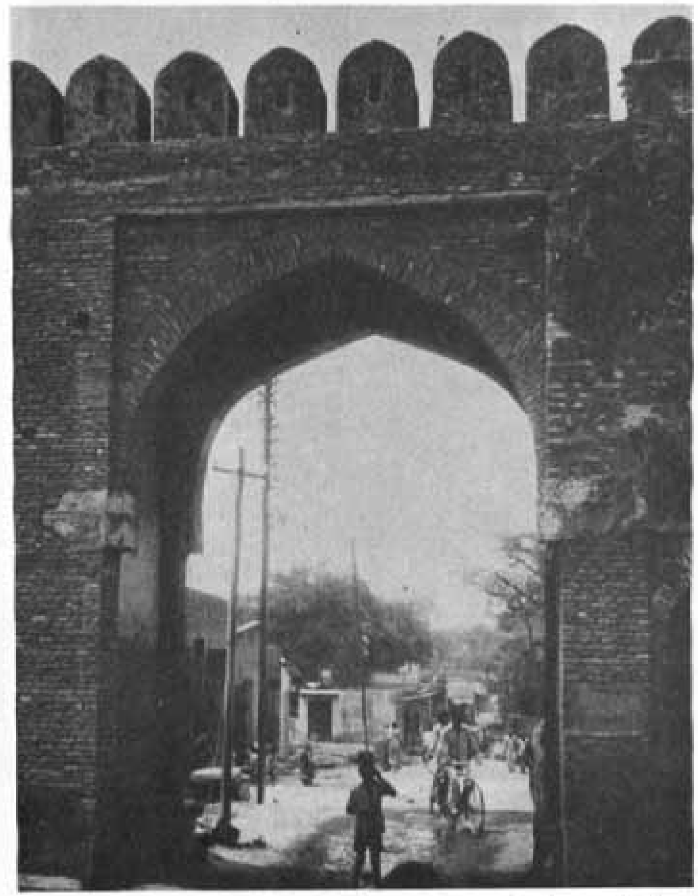
118 Bandalike Anekal sameswar temple : View showing the southern side of the temple before conservation. *See page 215*



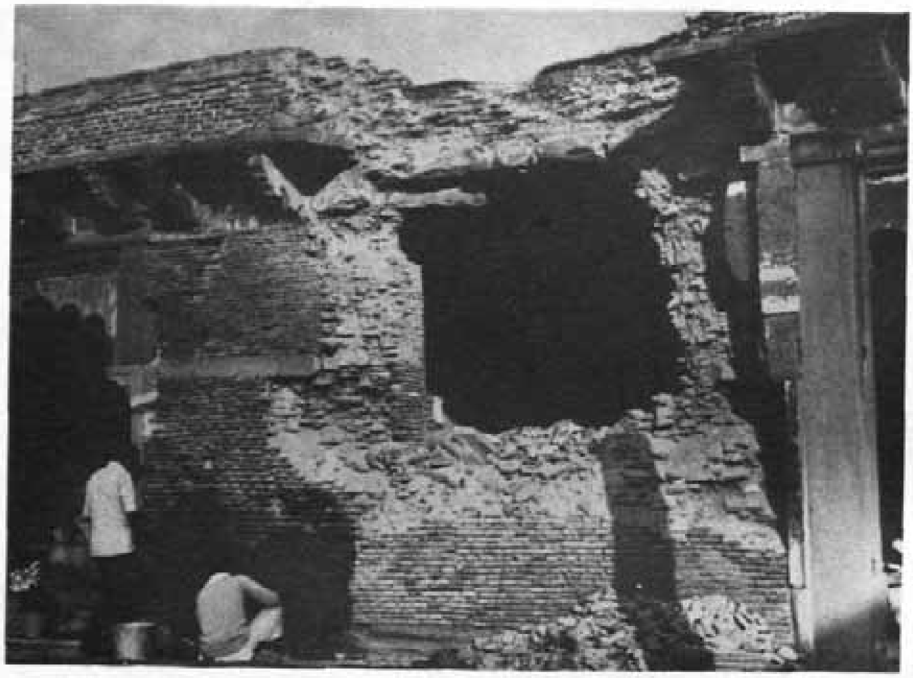
119 Bandalike Anekal sameswar temple : View showing the southern side of the temple after conservation. *See page 215*



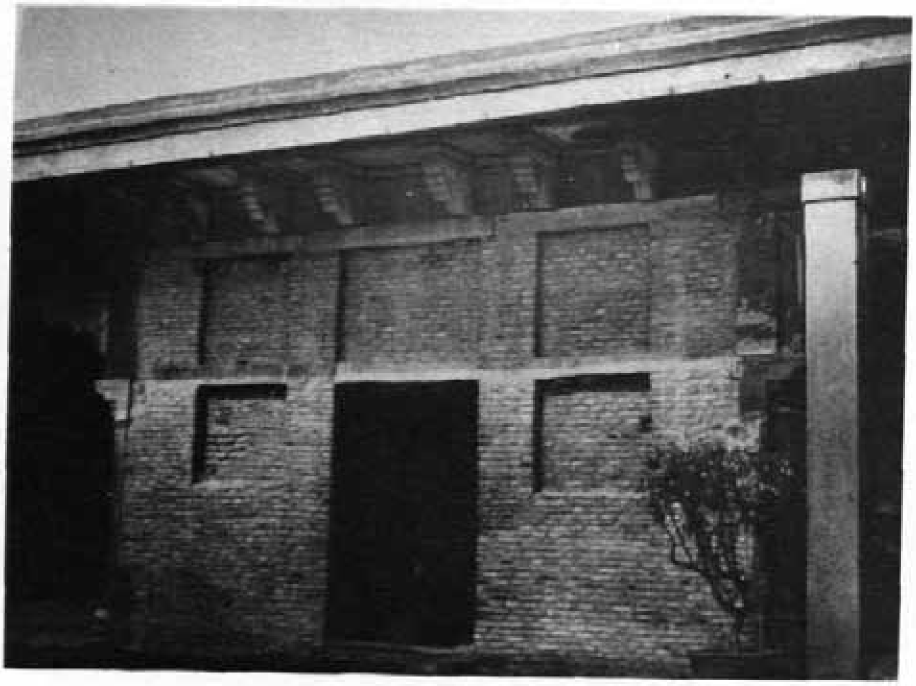
120 Pulchanga Modi at Agra : Gate way at pulchanga Modi north side facade before conservation. *See page 216*



121 Pulchanga Modi at Agra : Gate way at pulchanga Modi north side facade after conservation. *See page 216*



122 Taj Mahal : Glass house nursery before conservation. *See page 217*



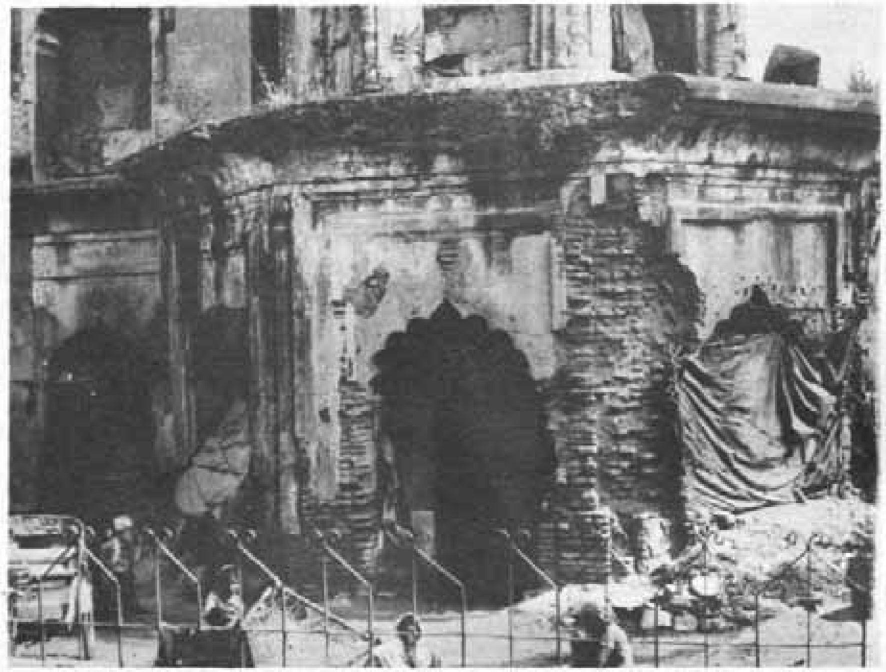
123 Taj Mahal : Glass house nursery after conservation. *See page 217*



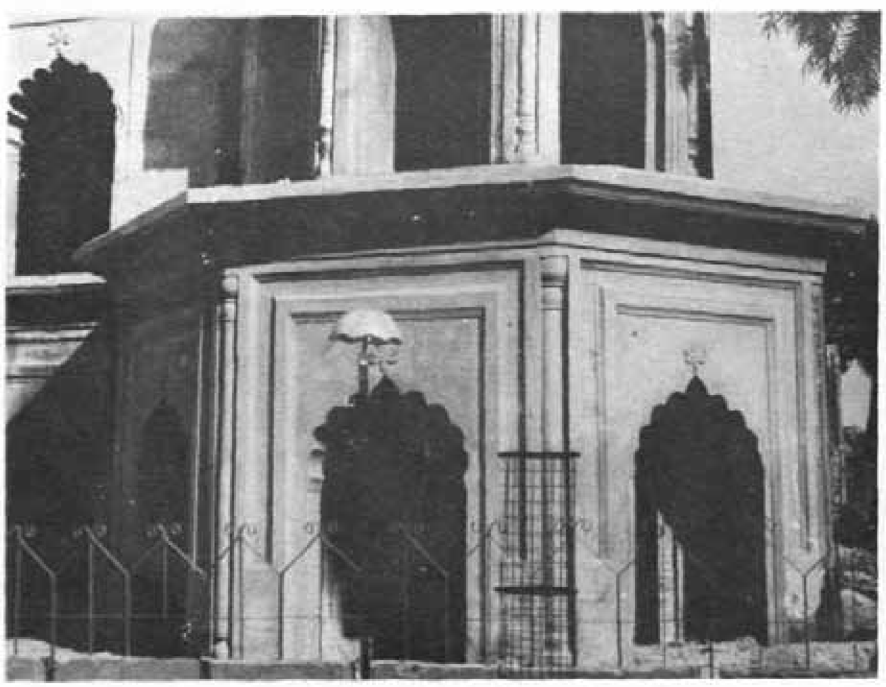
124 Asaf-ud Daula's Imambara, Lucknow : Southern fecade of 1st entrance gateway before conservation. *See page 218*



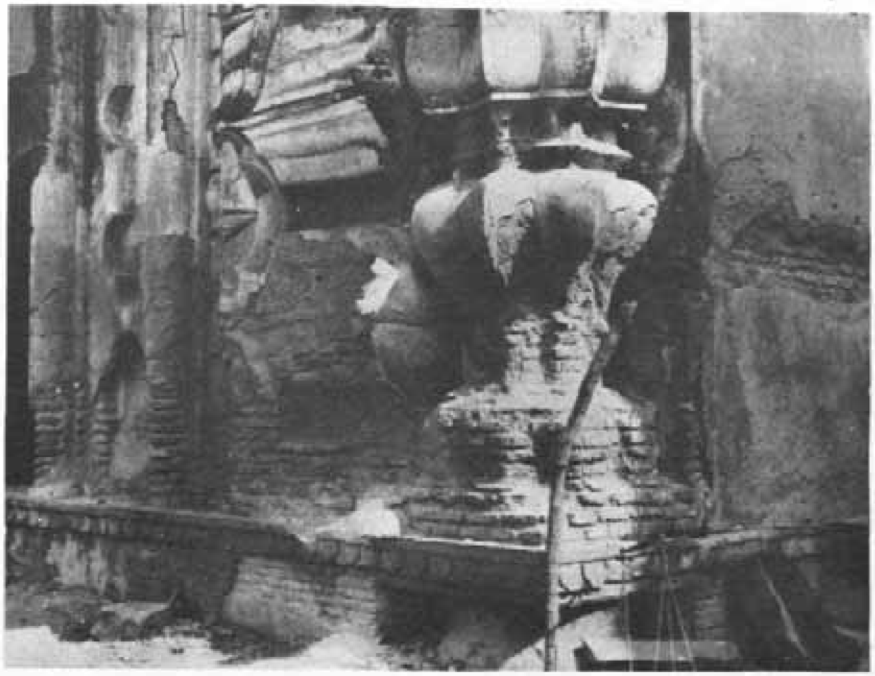
125 Asaf-uUd Daula's Imambara, Lucknow : Southern fecade of 1st entrance gateway after conservation. *See page 218*



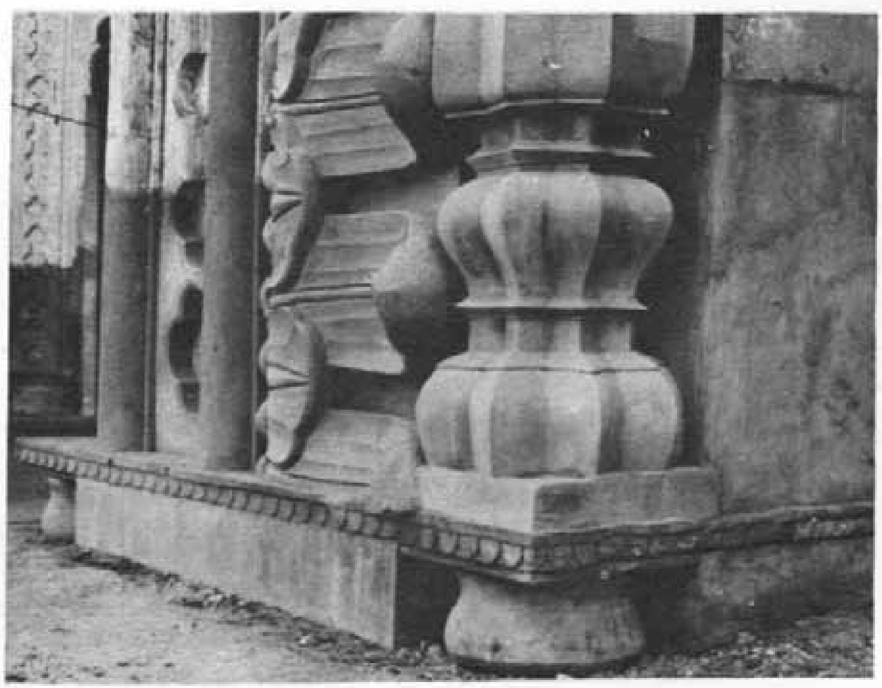
126 Lucknow Rumi Darwaja : South Bastion western fecade before conservation.
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127 Lucknow Rumi Darwaja : South Bastion western fecade after conservation.
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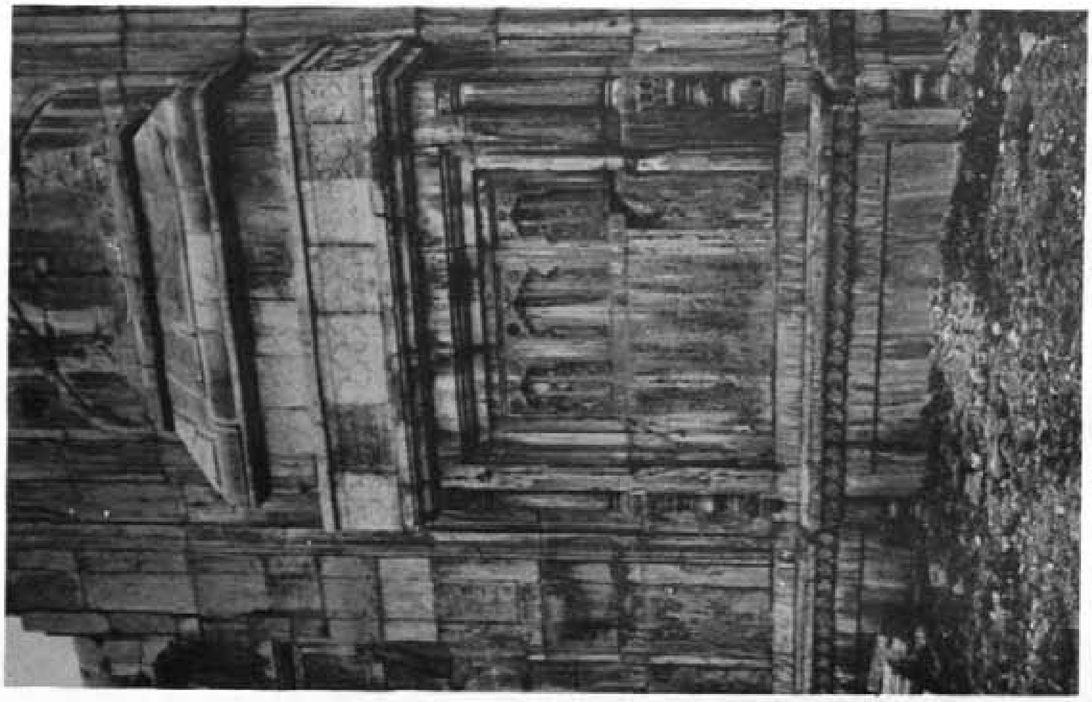
128 Lucknow Rumi Darwaja : Before conservation. *See page 219*



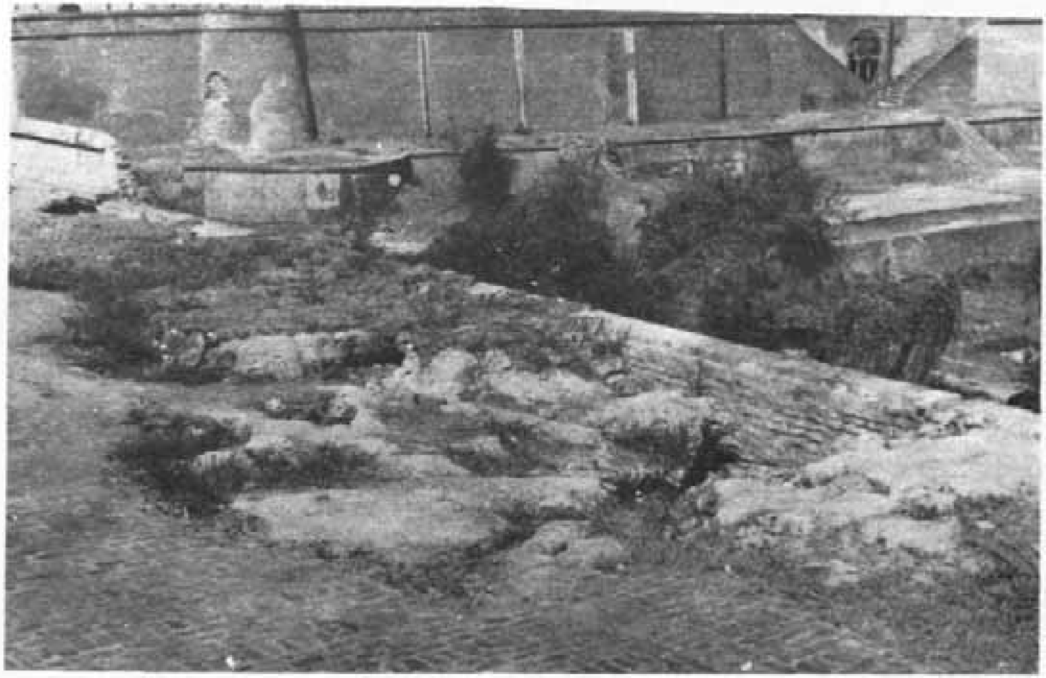
129 Lucknow Rumi Darwaja : After ponservation. *See page 219*



130 Srinagar : Mosque of Akun Mulla Shah before conservation.
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131 Srinagar : Mosque of Akun Mulla Shah after conservation.
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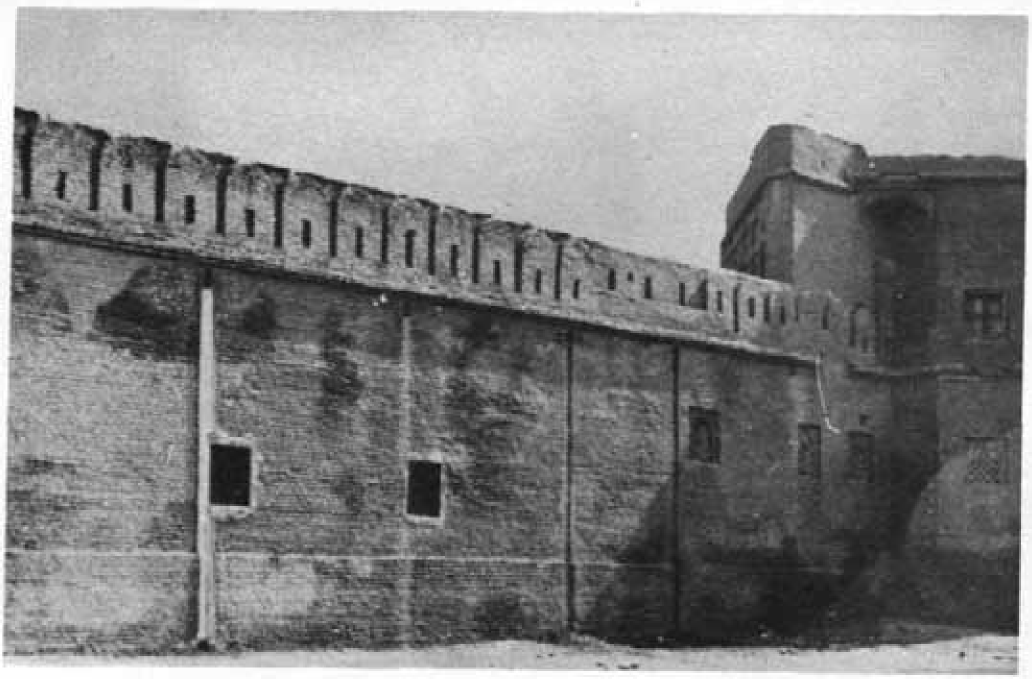
132 Bhatinda : Fort before conservation. *See page 222*



133 Bhatinda : Fort after conservation. *See page 222*



134 Nurmahal : Mughal Sarai including gateways before conservation. *See page 222*



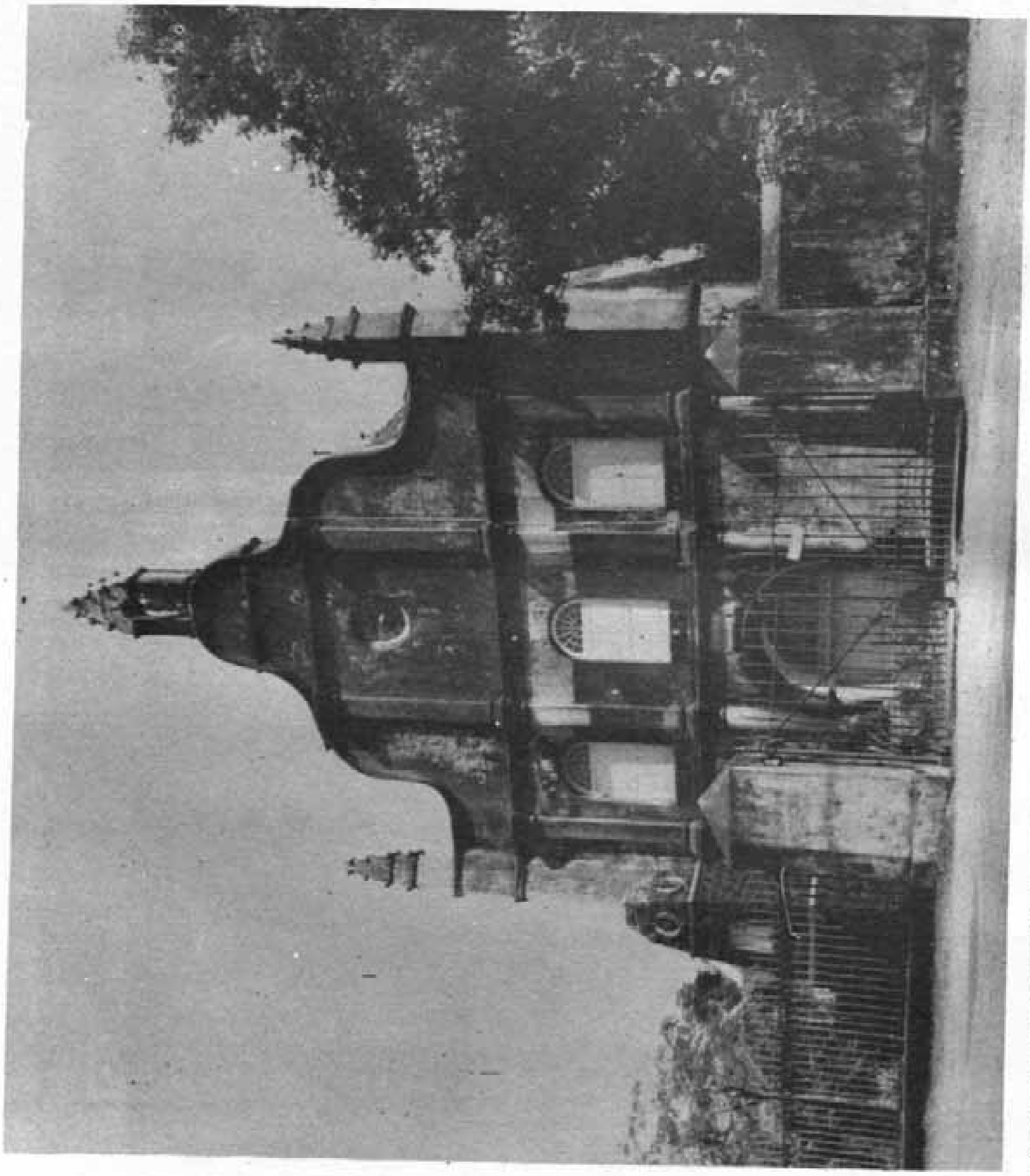
135 Nurmahal : Mughal Sarai including gateways after conservation. *See page 222*



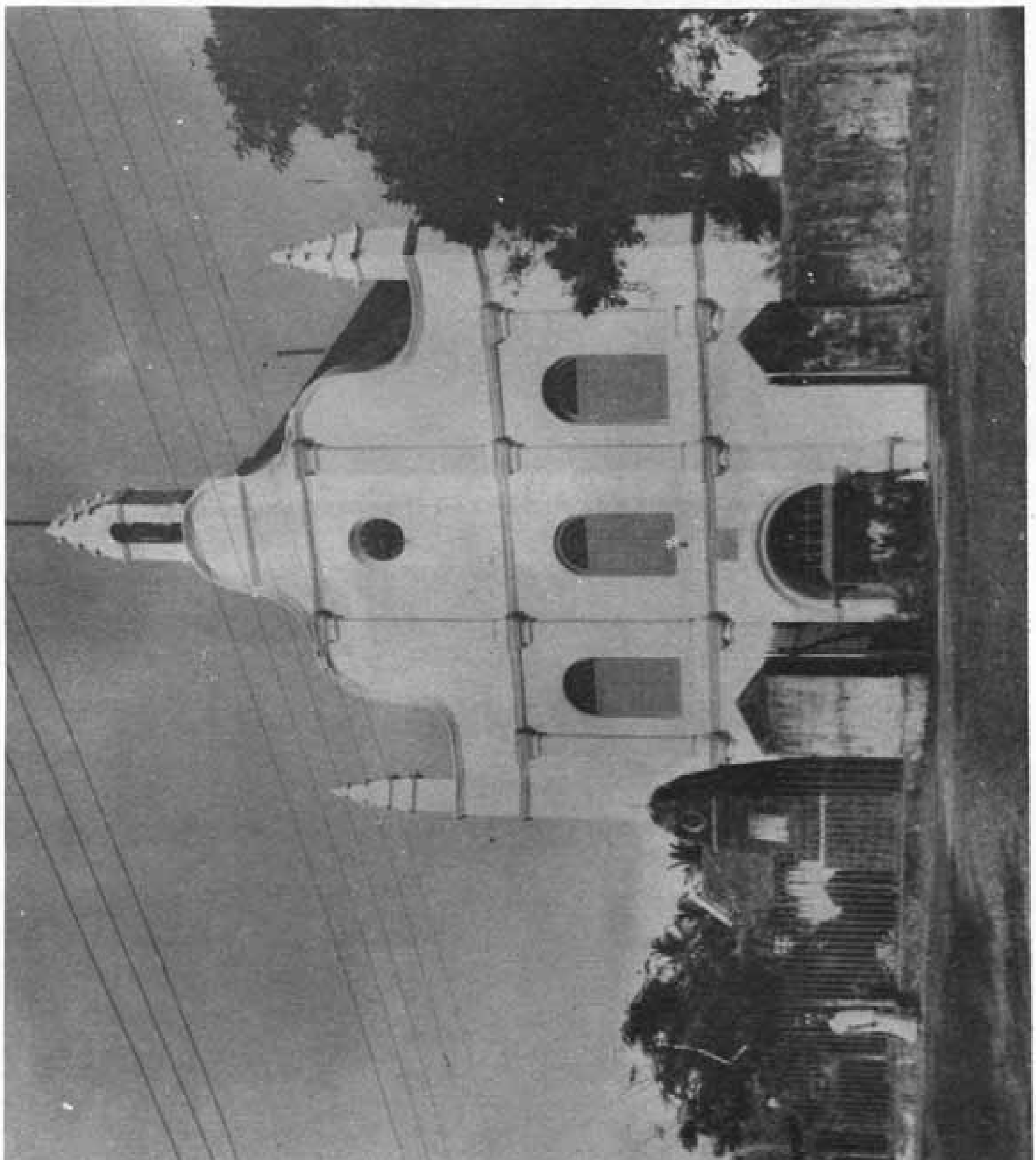
136. Fort St. Angelo, Cannanore : Showing the leaky terrace of the horse stables before conservation. *See page 223*



137 Fort St. Angelo, Cannanore : Showing the leaky terrace of the horse stables after conservation *See page 223*



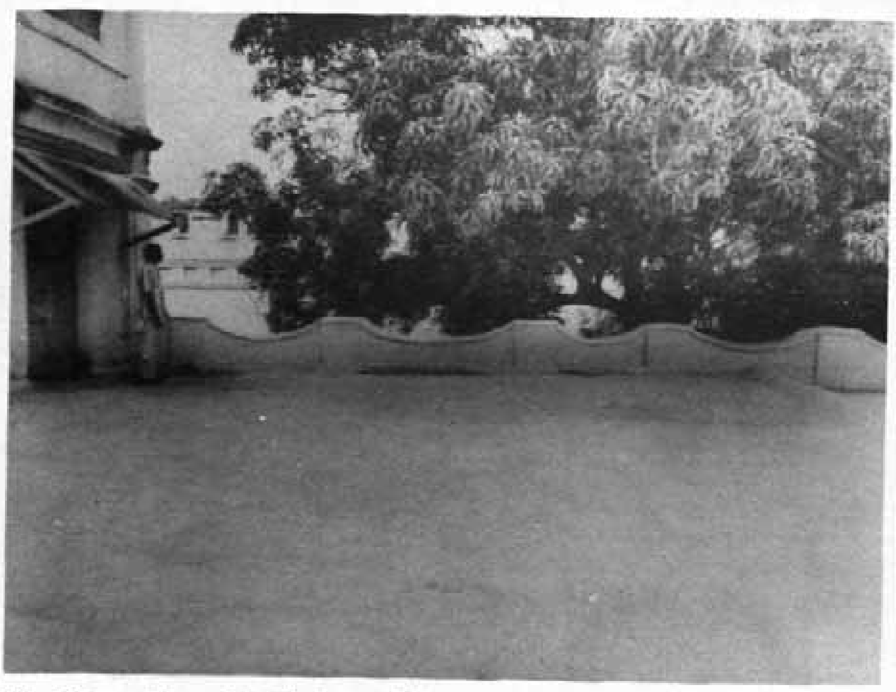
138 St. Francies Church Cochin : Before conservation. *See page 223*



139 St. Francis Church Cochin : After conservation. *See page 223.*



140 Big-ware house Fort St. George Madras : View of the decayed Madras terrace roof before conservation. *See page 224*



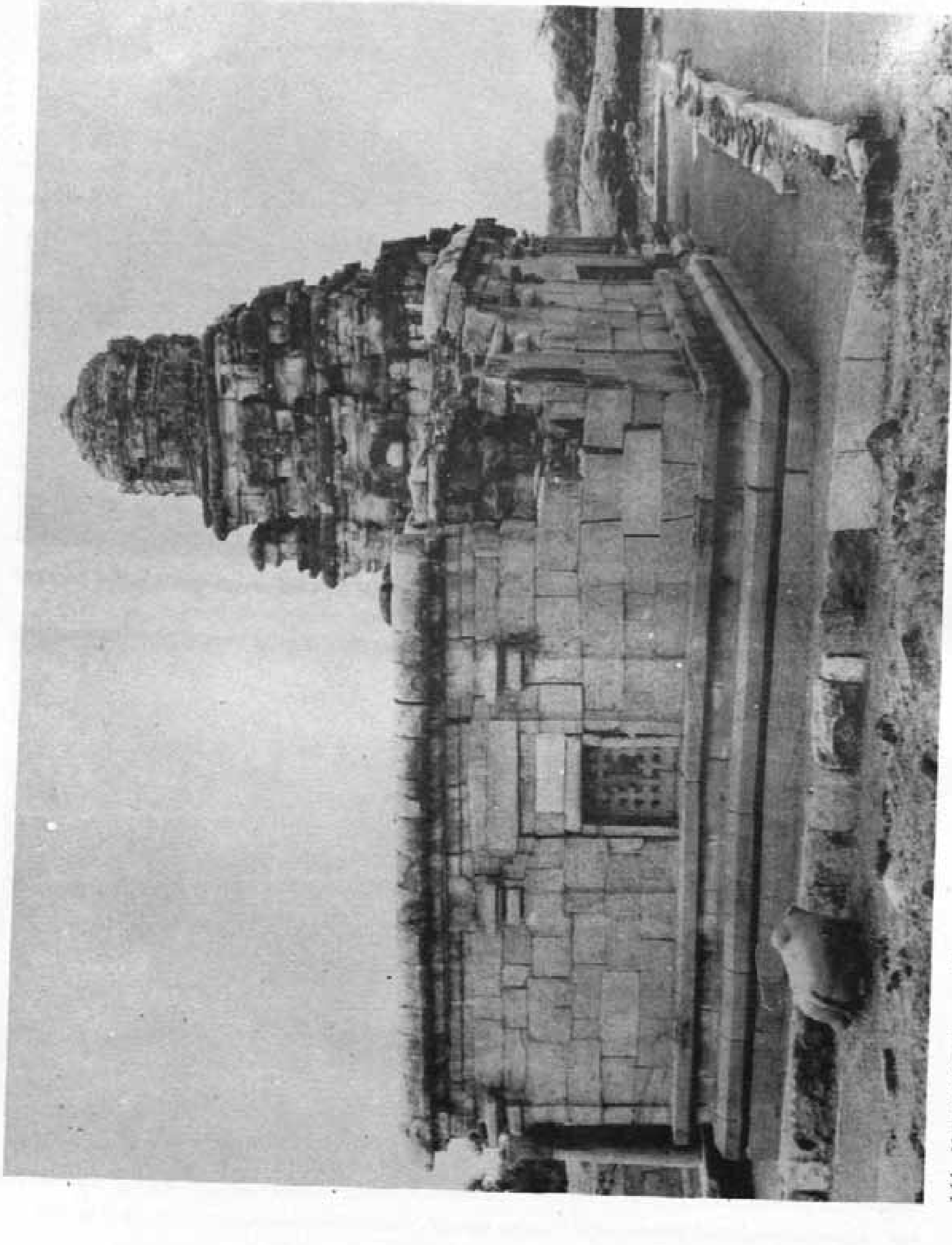
141 Big-ware house Fort St. George Madras : View of the decayed Madras terrace roof after conservation. *See page 224*



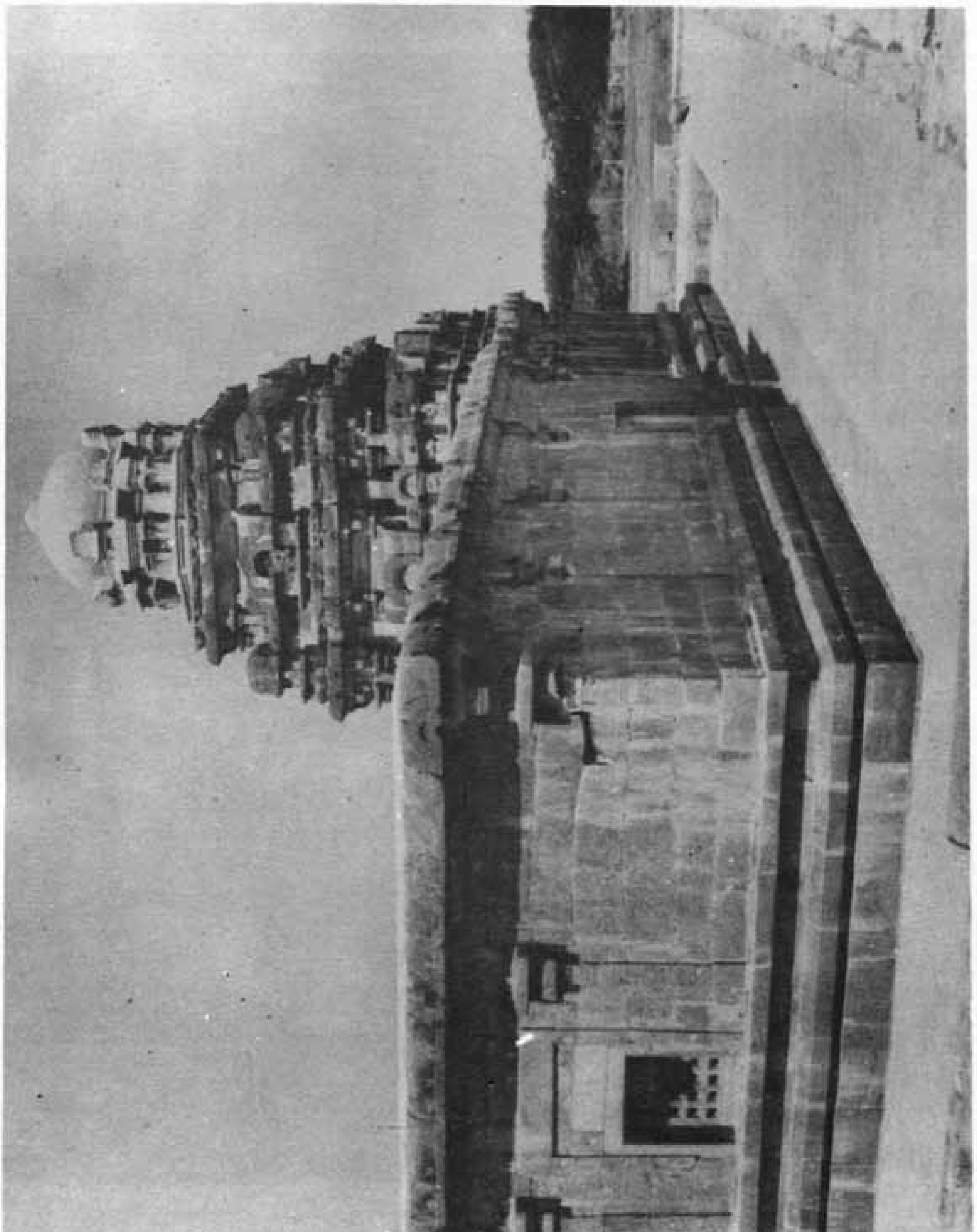
142 Kilputtur Svyanbhunatha Temple : General view of the *Mandapa* before conservation. See page 224



143 Kilputtur Svyanbhunatha Temple : General view of the *Mandapa* after conservation. See page 224



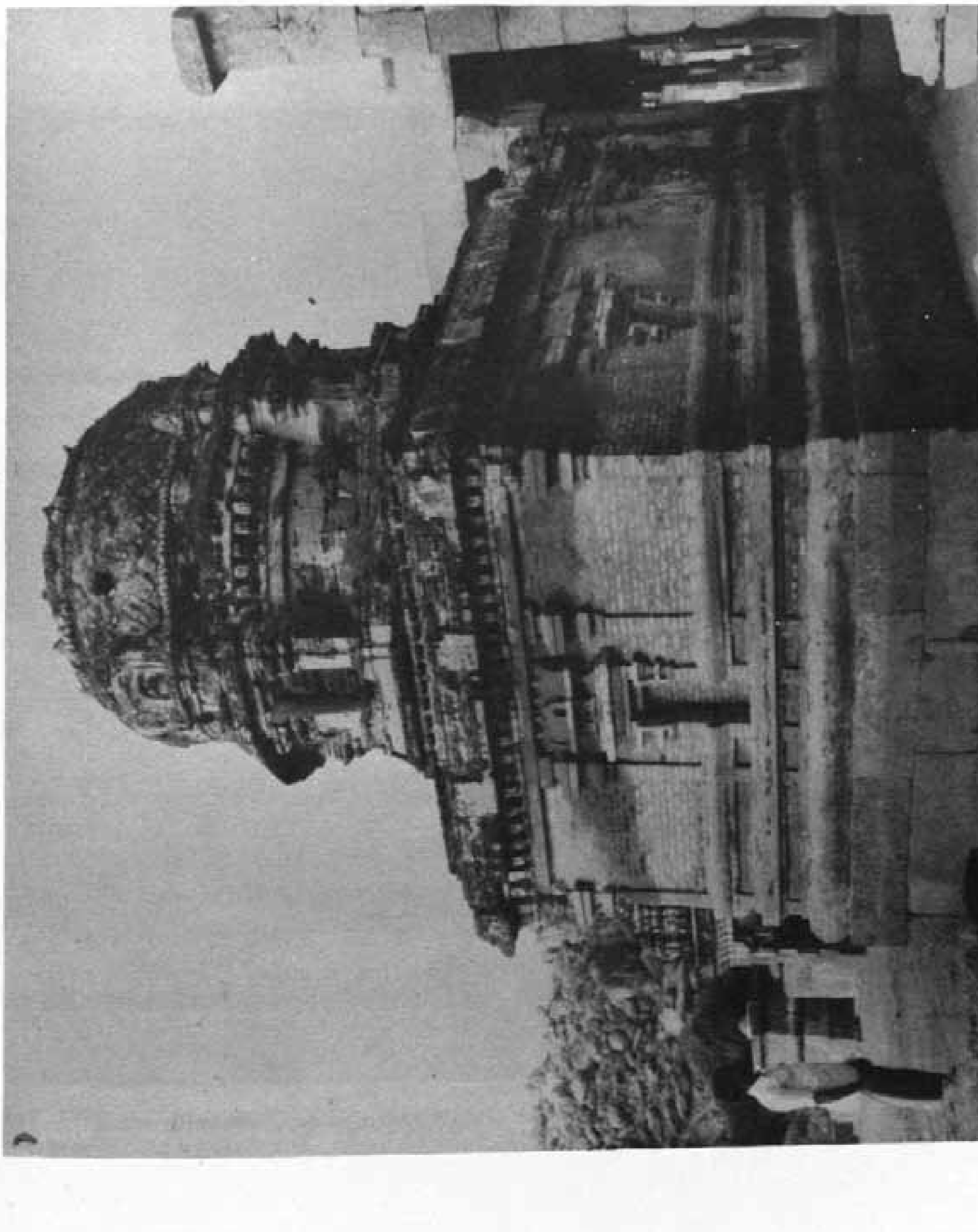
144 Nattery Chandra moulisvar temple : View showing the damaged and art of plumb *Prakara* wall before conservation. *See page 224*



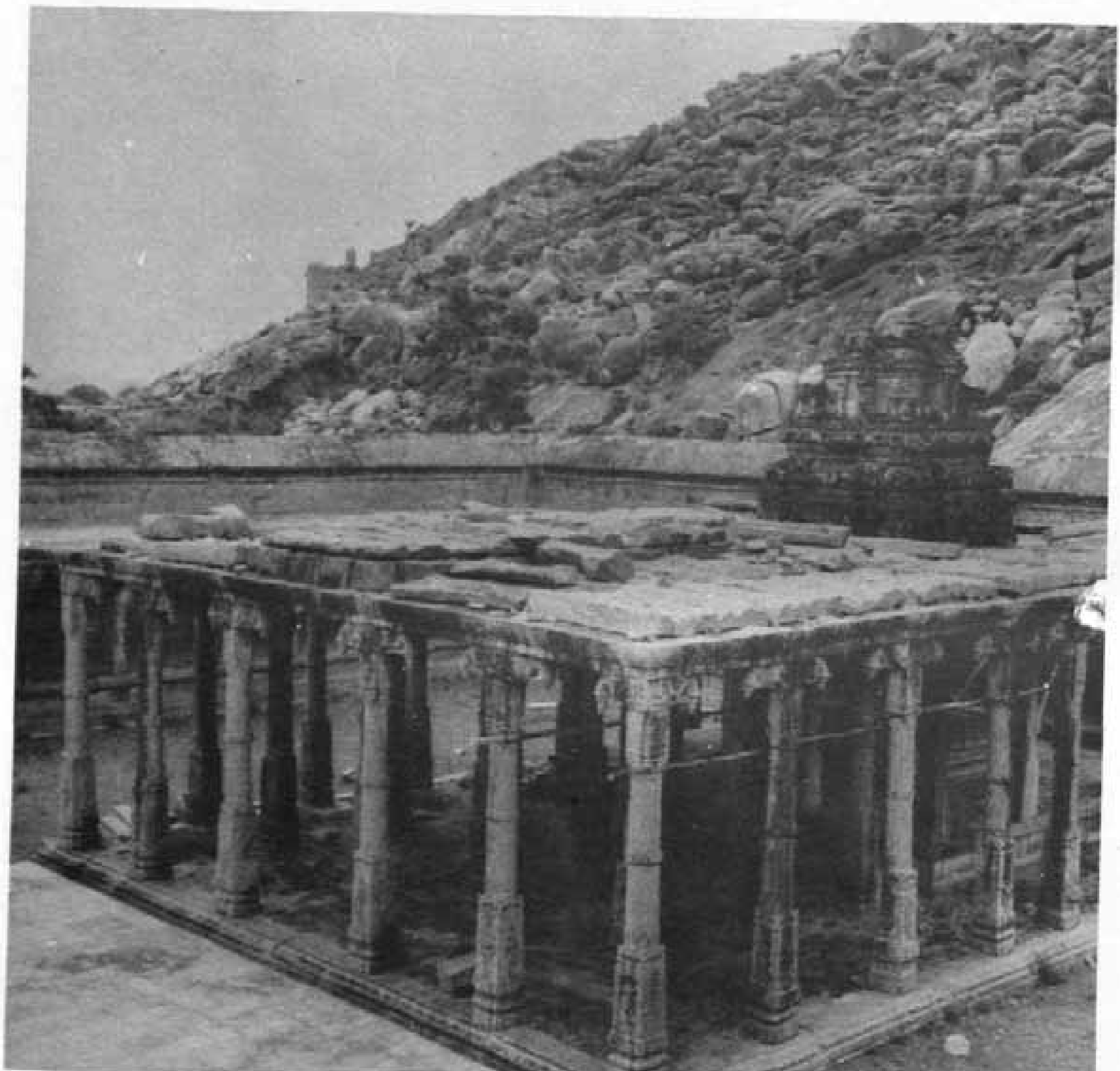
145 Nattery Chandra moulisvar temple : View showing the damaged and art of plumb *Prakara*wall after conservation. *See page 224*



146 Siya Manglam Rockcut cave temple : View showing the art of plumb portion of the Ganesh Shrine before conservation.
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147 Siya Manglam Rockcut cave temple : View showing the art of plumb portion of the Ganesh Shrine after conservation.
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148 Gingee 'Venkataramana temple : General view of the Pillared *mandapa* before conservation.
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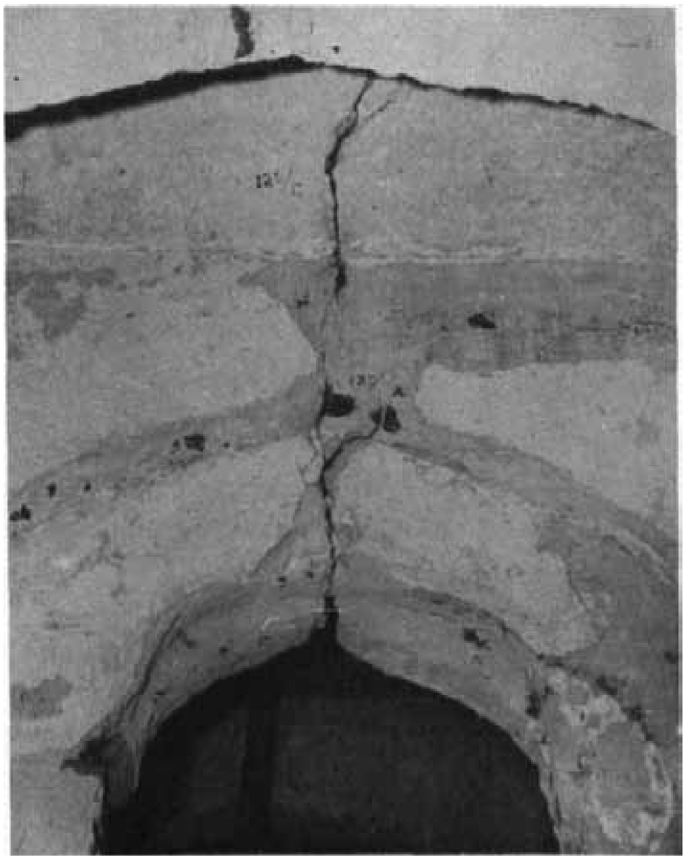
149 Gingee Venkantaramana temple : General view of the Pillared *mandapa* after conservation.
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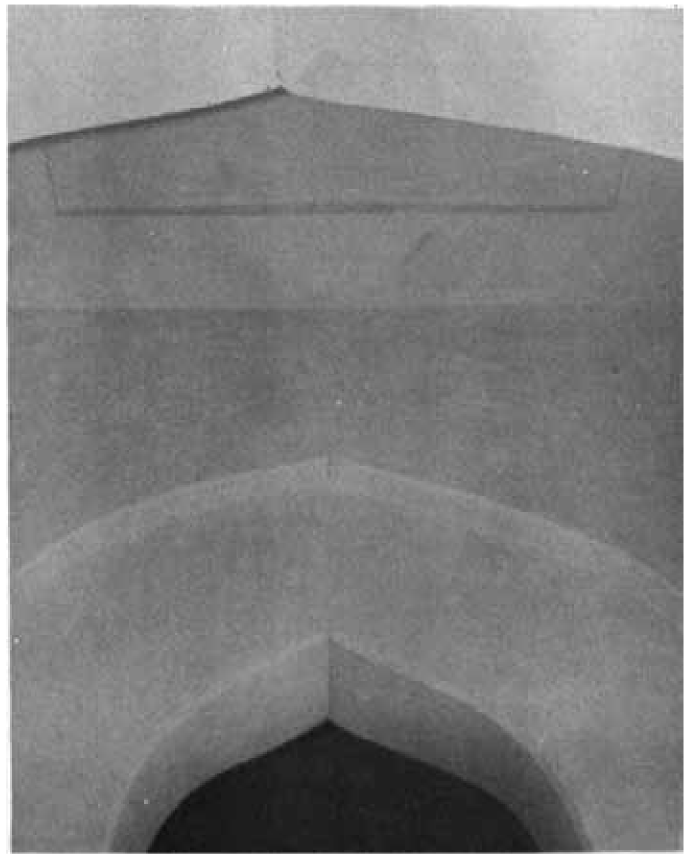
150 Venkatesa Perumal temple, Tirumukkudal : View showing before the removal and re-erection of Anjaneya subshrine before conservation. *See page 225*



151 Venkatesa Perumal temple, Tirumukkudal : View showing before the removal and re-erection of Anjaneya subshrine after conservation. *See page 225*



152 Ranimahal at Chandragiri : Cracks in the ceiling of **first floor before conservation.** *See page 225*



153 Ranimahal at Chandragiri : Cracks in the ceiling of first floor after conservation. See *page 225*



154 Lady Rosary Church : General view from west before conservation. ***See page 226***



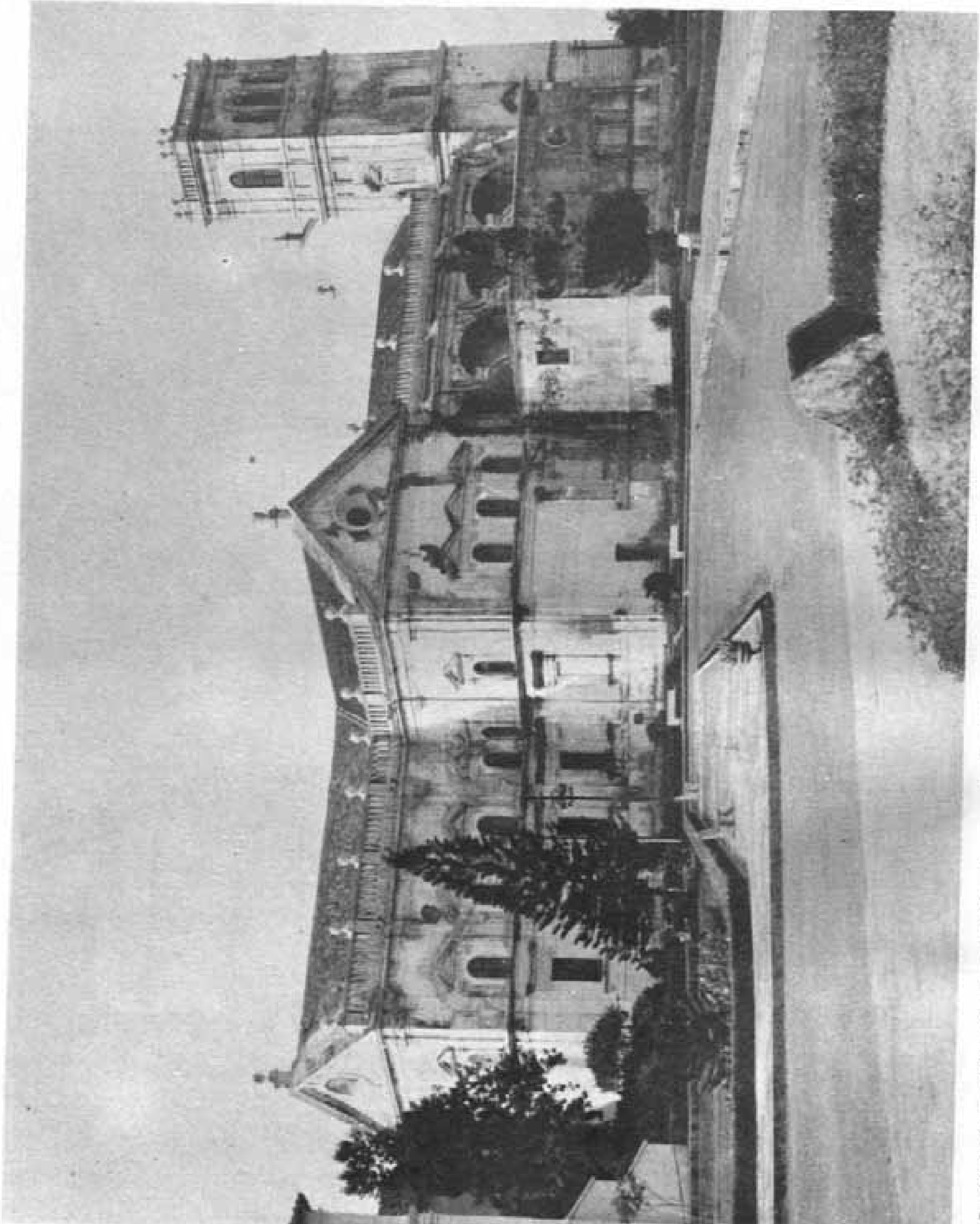
155 Lady Rosary Church : General view from west after conservation. *See page 226*



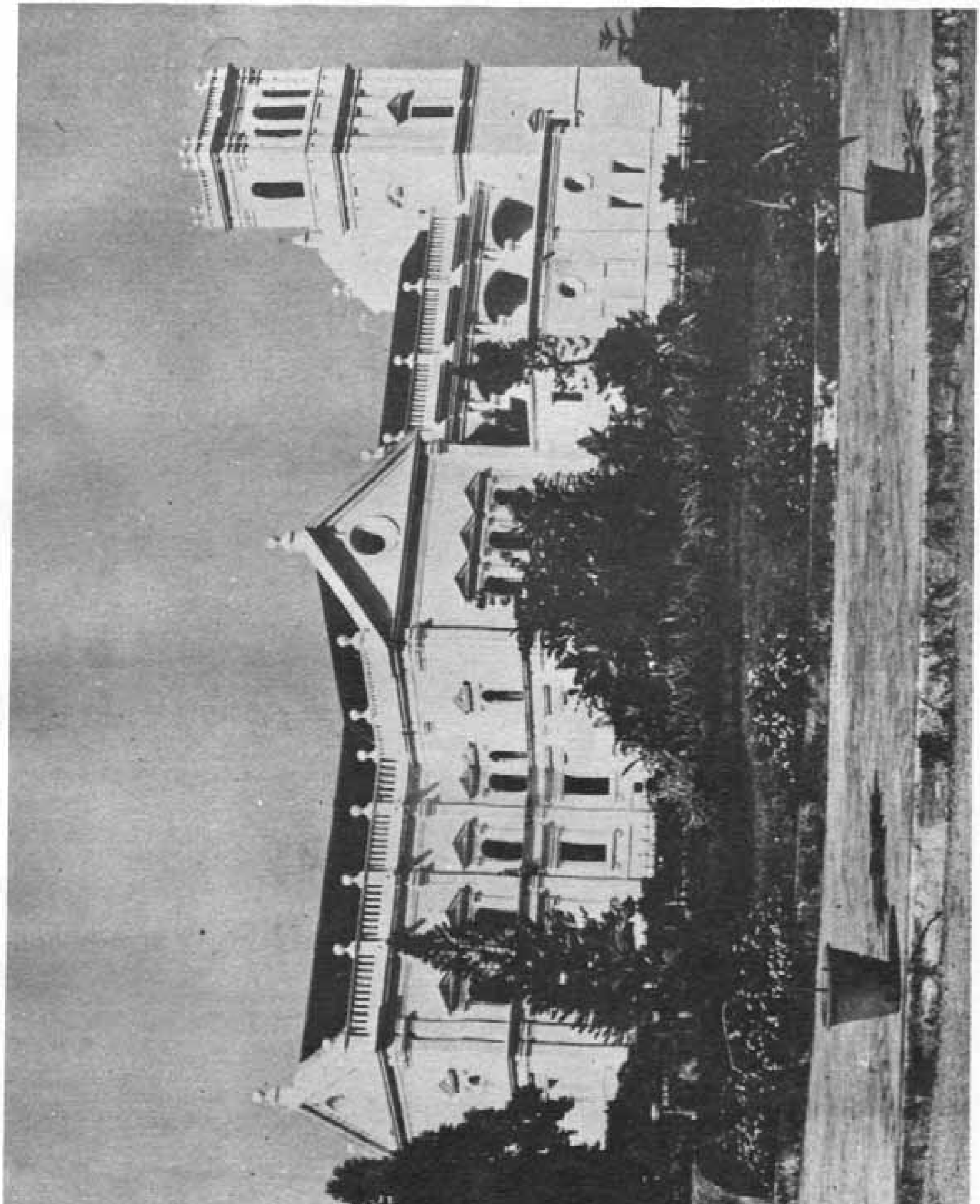
156 Str Assisi Church : General view of the facade from west before conservation. *See page 227*



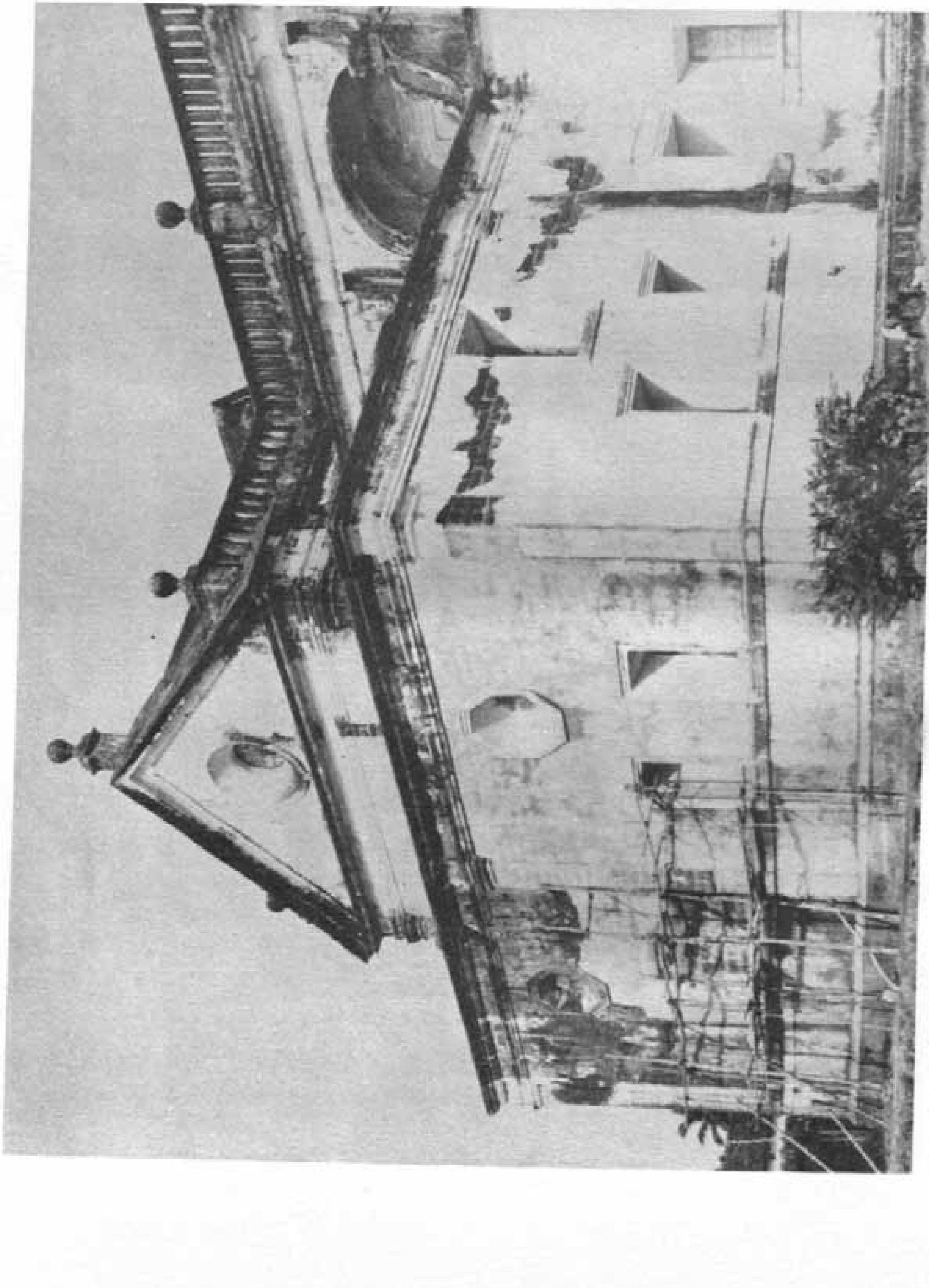
157 St. Assisi Church : General view of the facade from west after conservation. *See page 227*



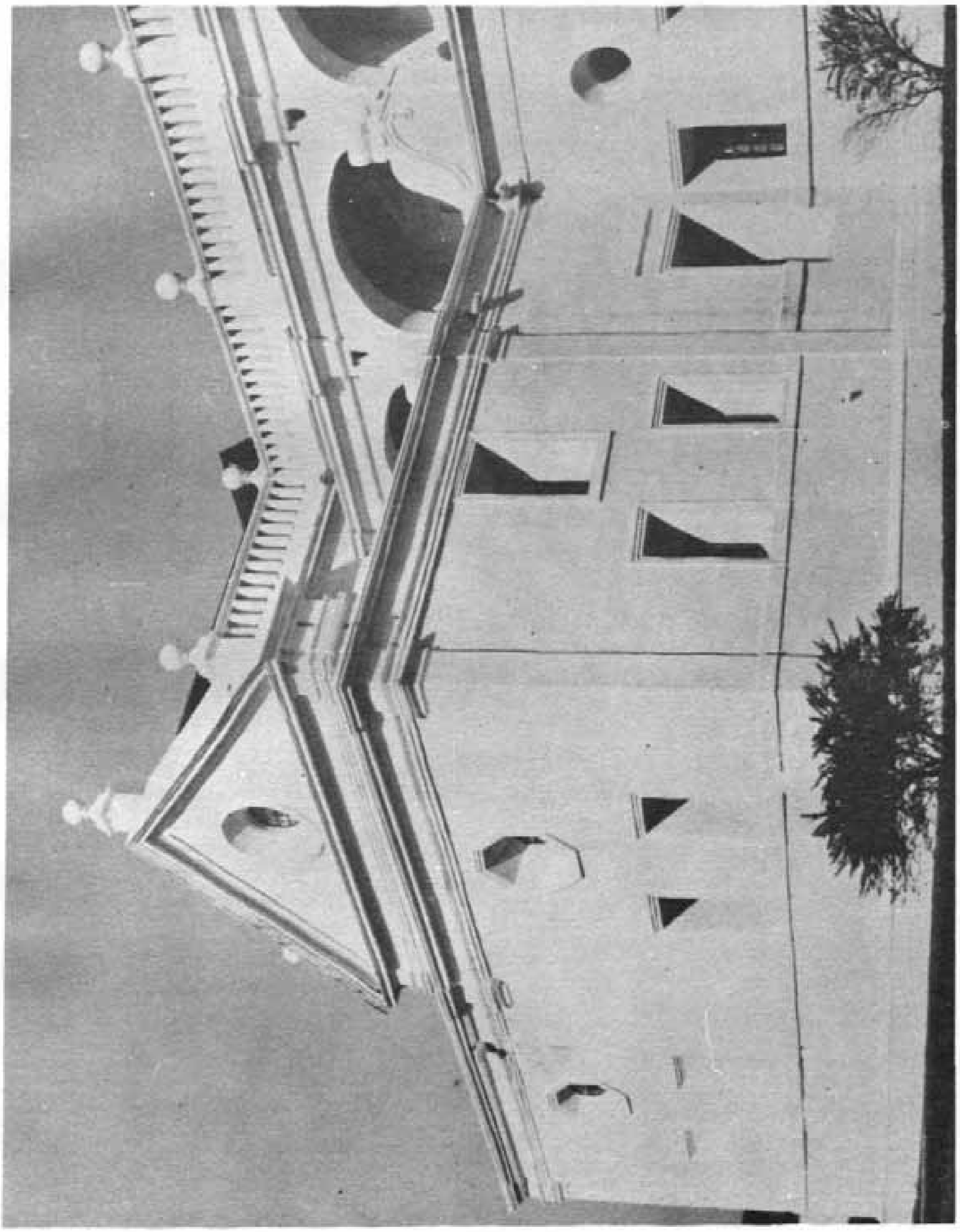
158 Se Cathedral Church : General view from south side before conservation. *See page 227*



159 Se Cathedral Church : General view from south side after conservation. *See page 227*



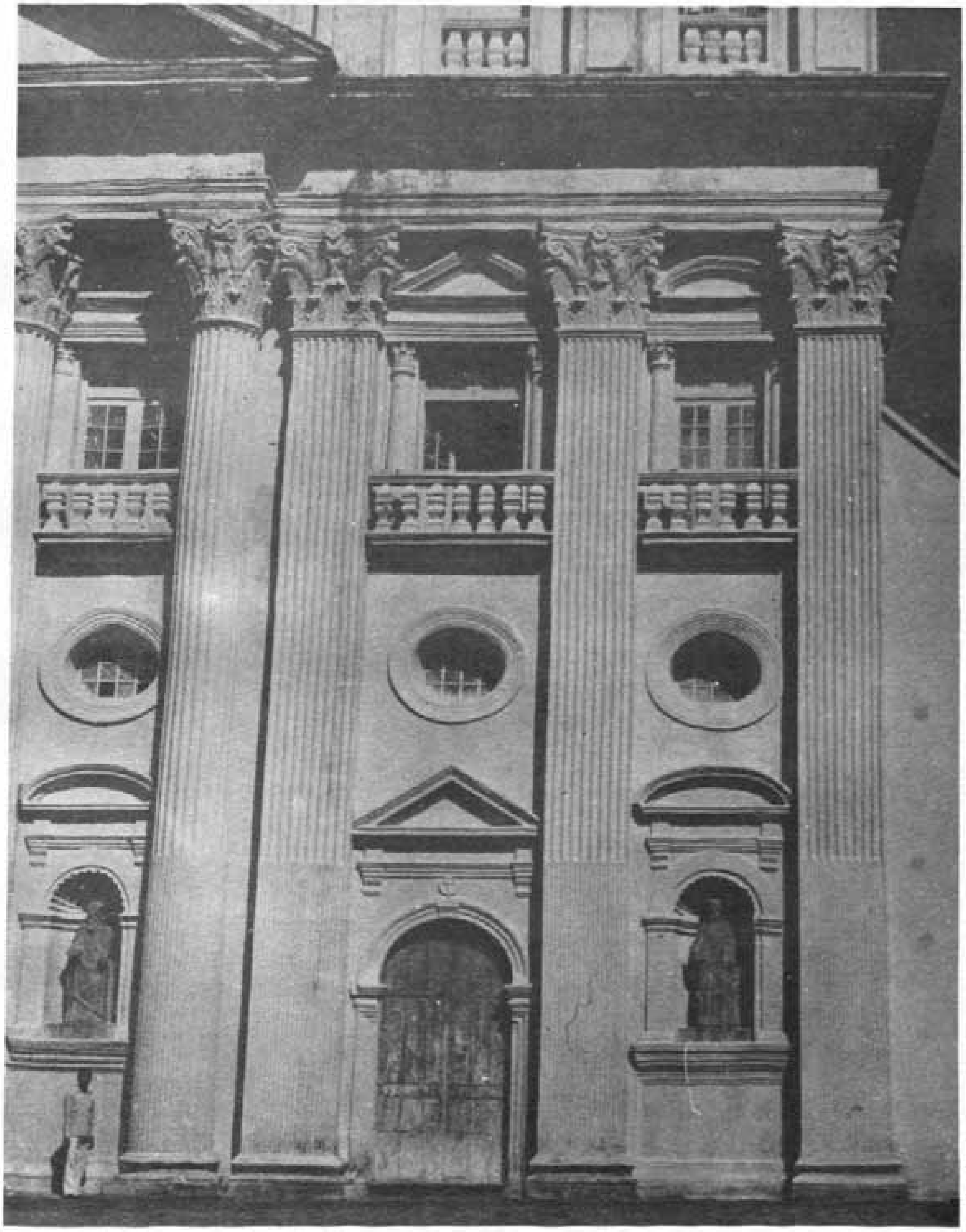
160 Se Cathedral Church : View from south west corner before conservation. *See page 227*



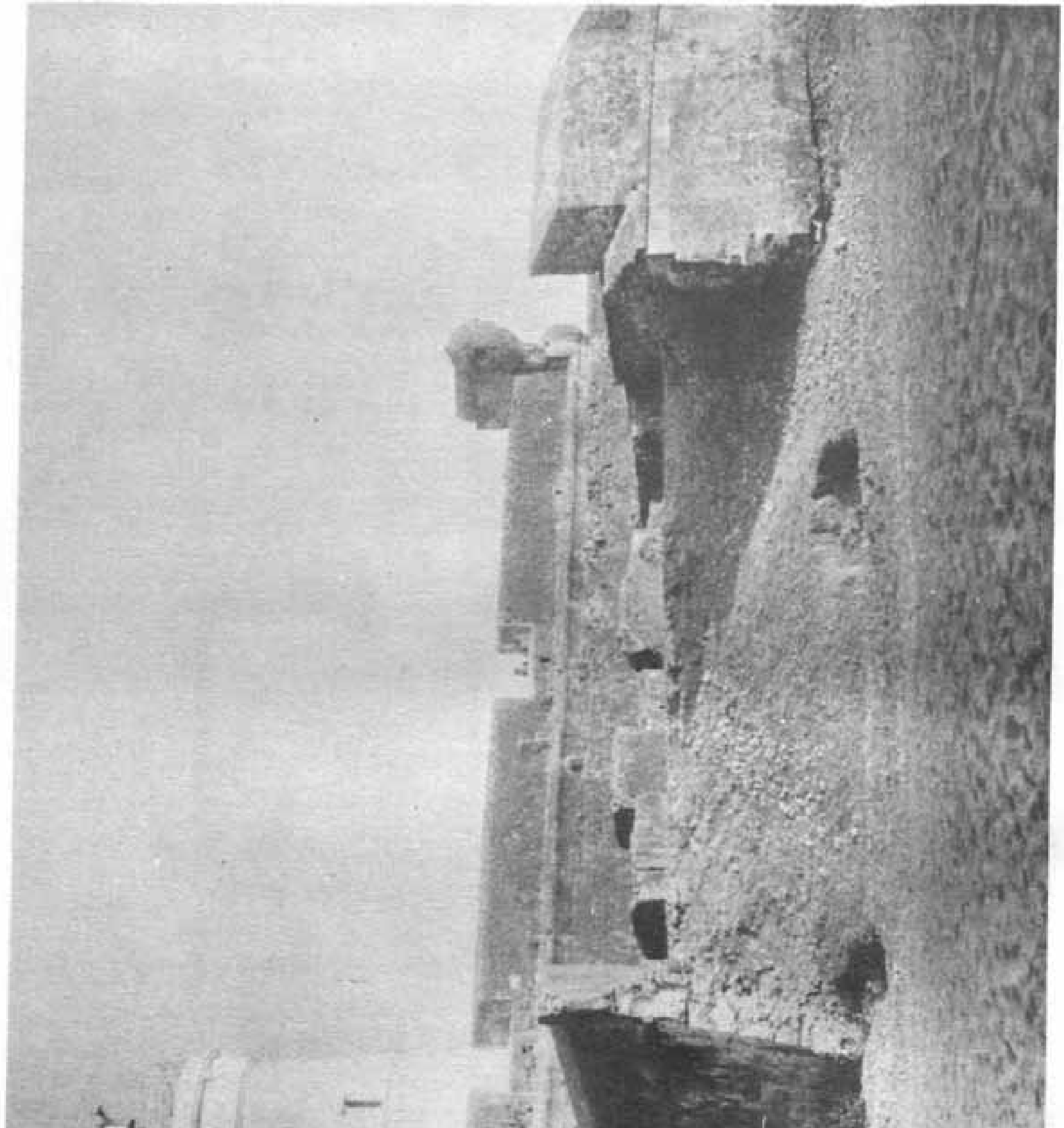
161 Se Cathedral Church : View from south west corner after conservation. *See page 227*



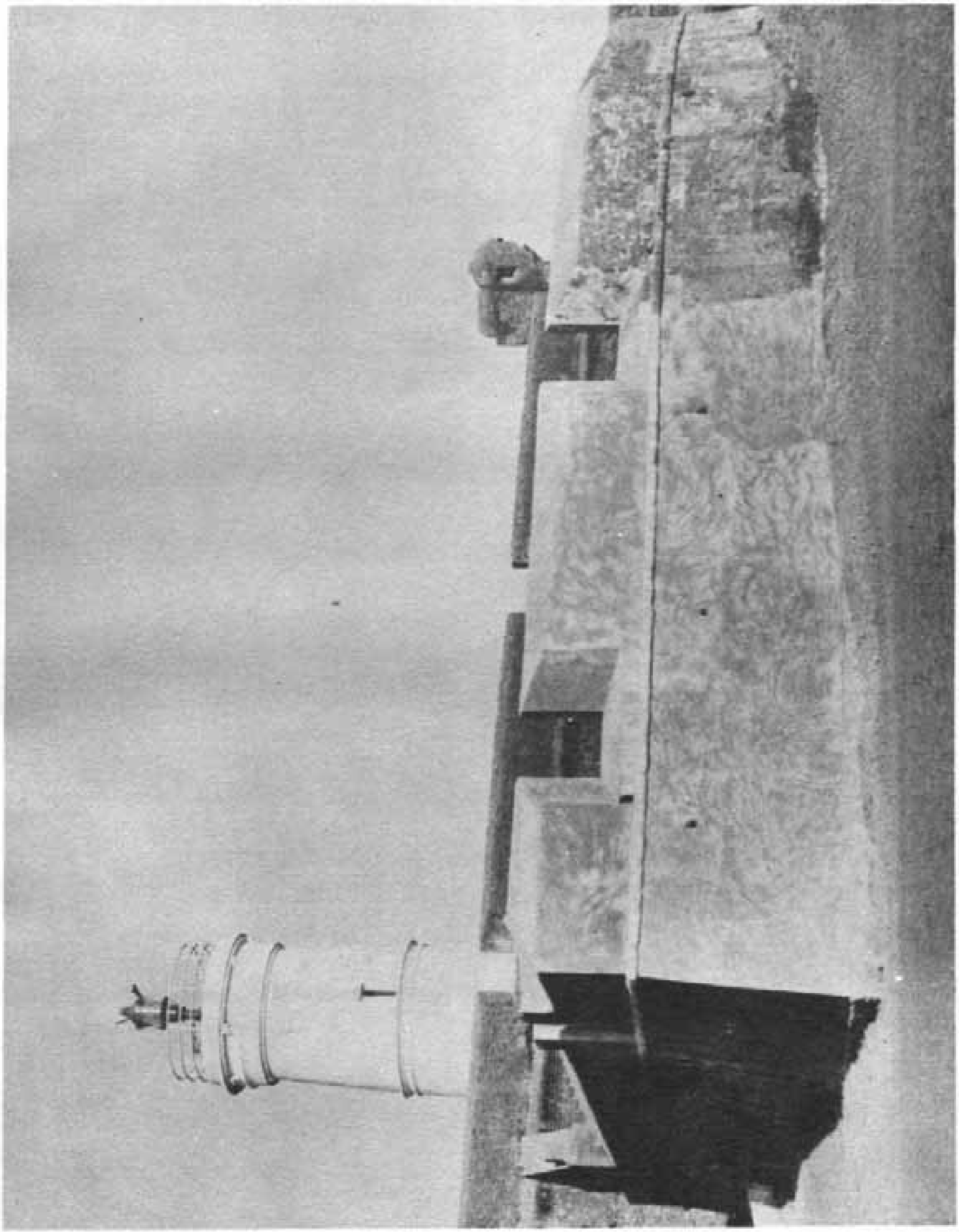
162 St. Cajethan Church : Close up of the part of facade from west before conservation, *See page 227*



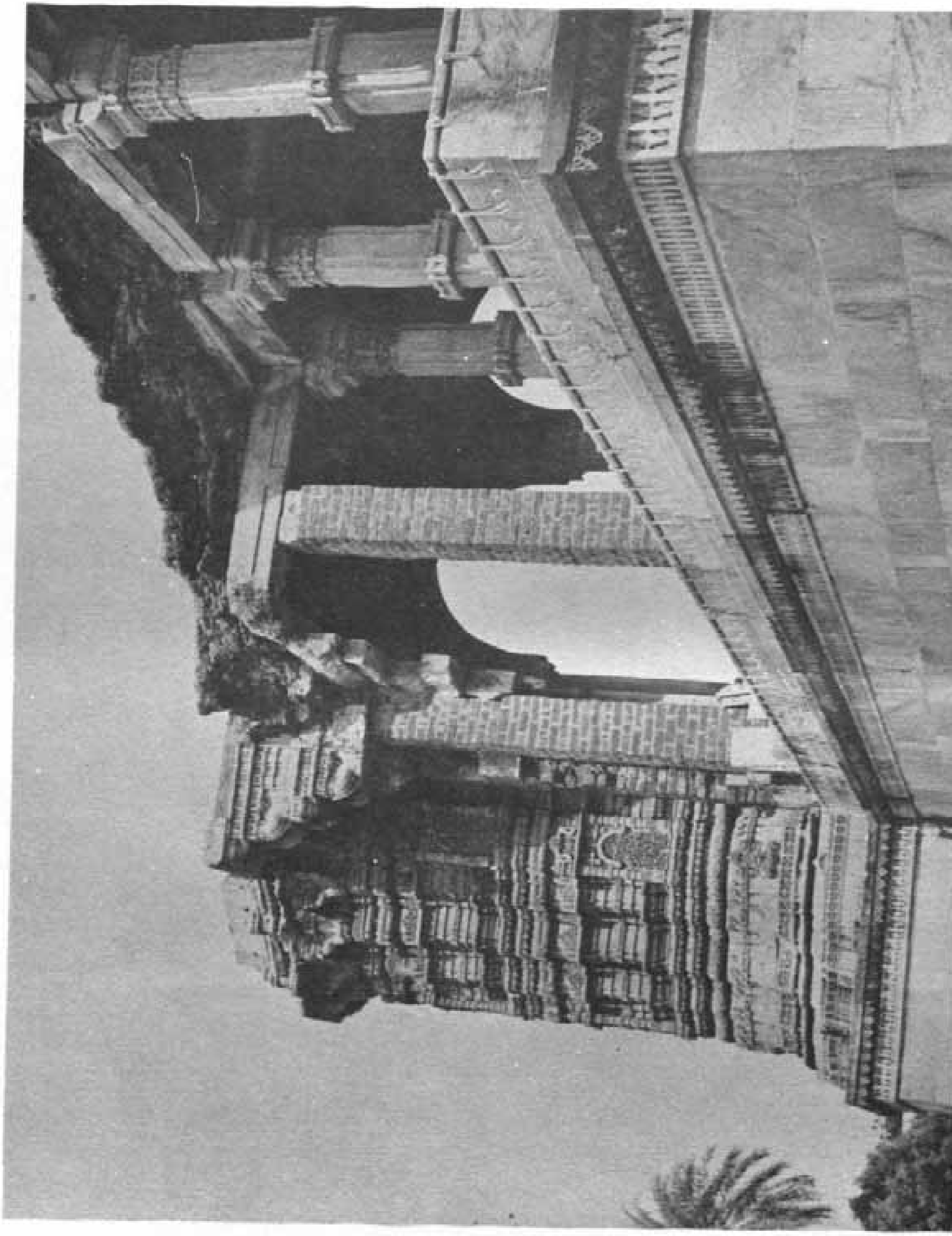
163 St. Cajethan Church : Close up of the part of facade from west after conservation. *See page 227*



164 Moti Daman : Structure outside north-west corner of fort wall before conservation. *See page 228*



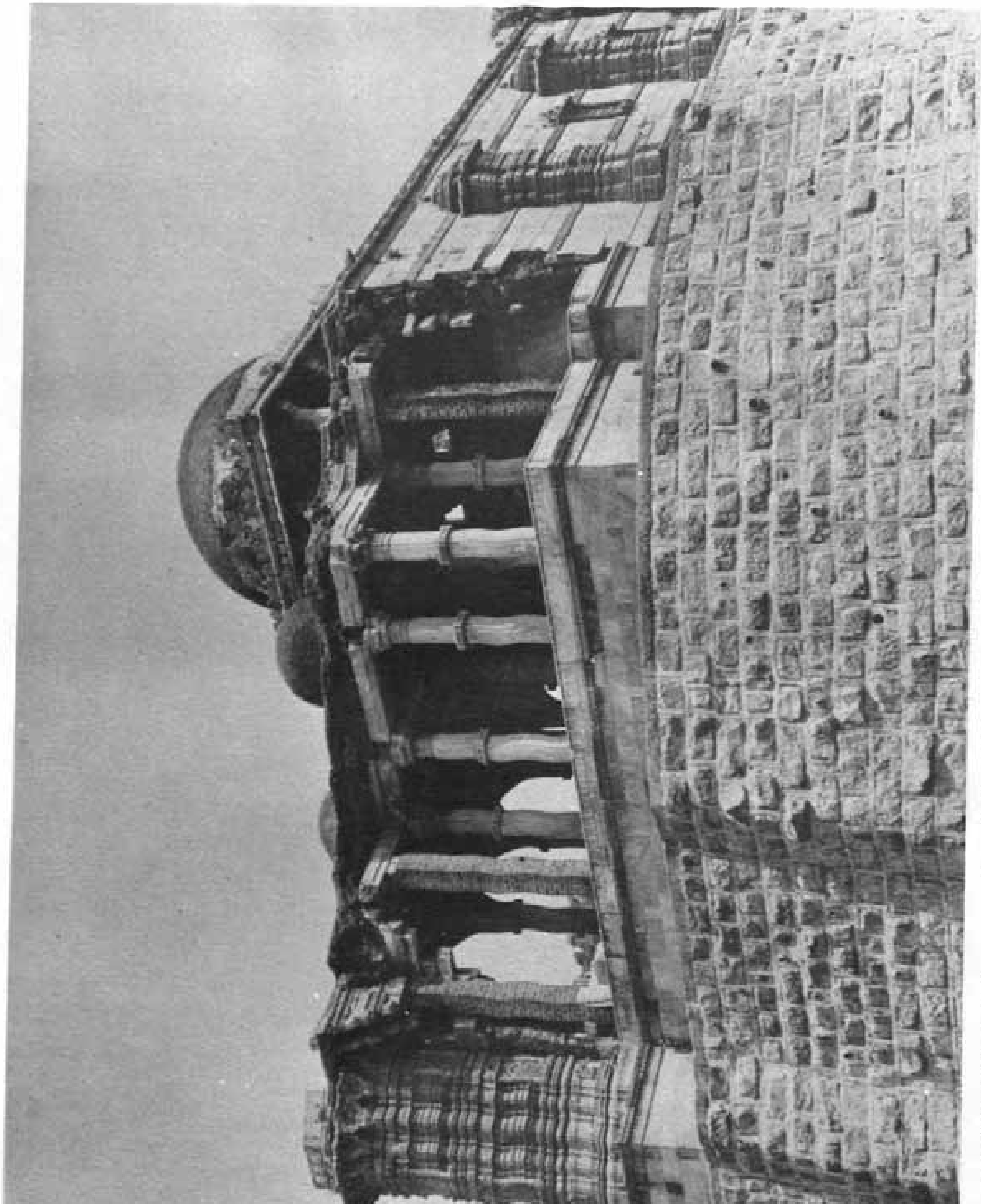
165 Moti Daman : Structure outside north-west corner of fort wall after conservation. *See page 228*



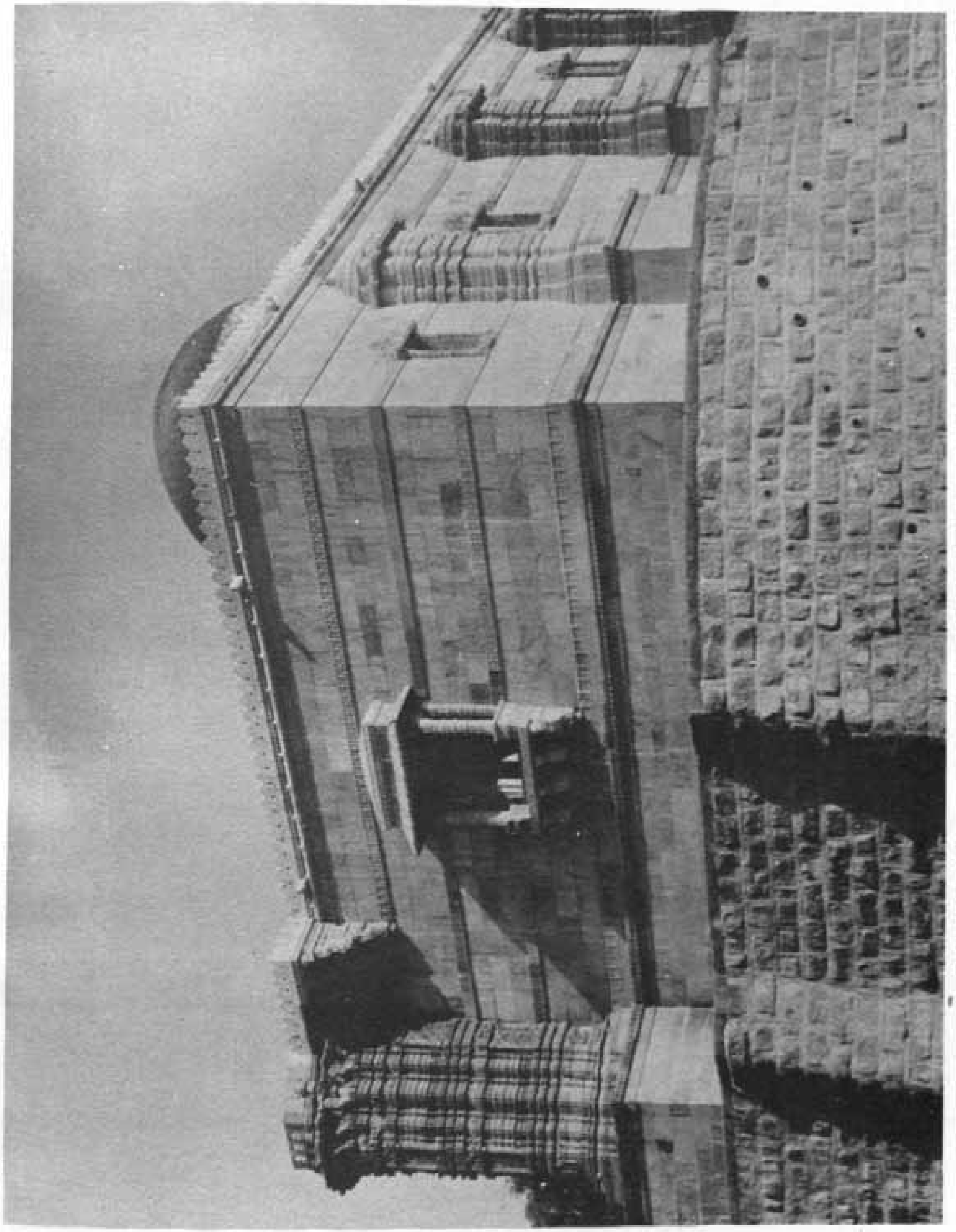
166 Ahmedabad Baba Lauli's mosque : Before conservation. *See page 229*



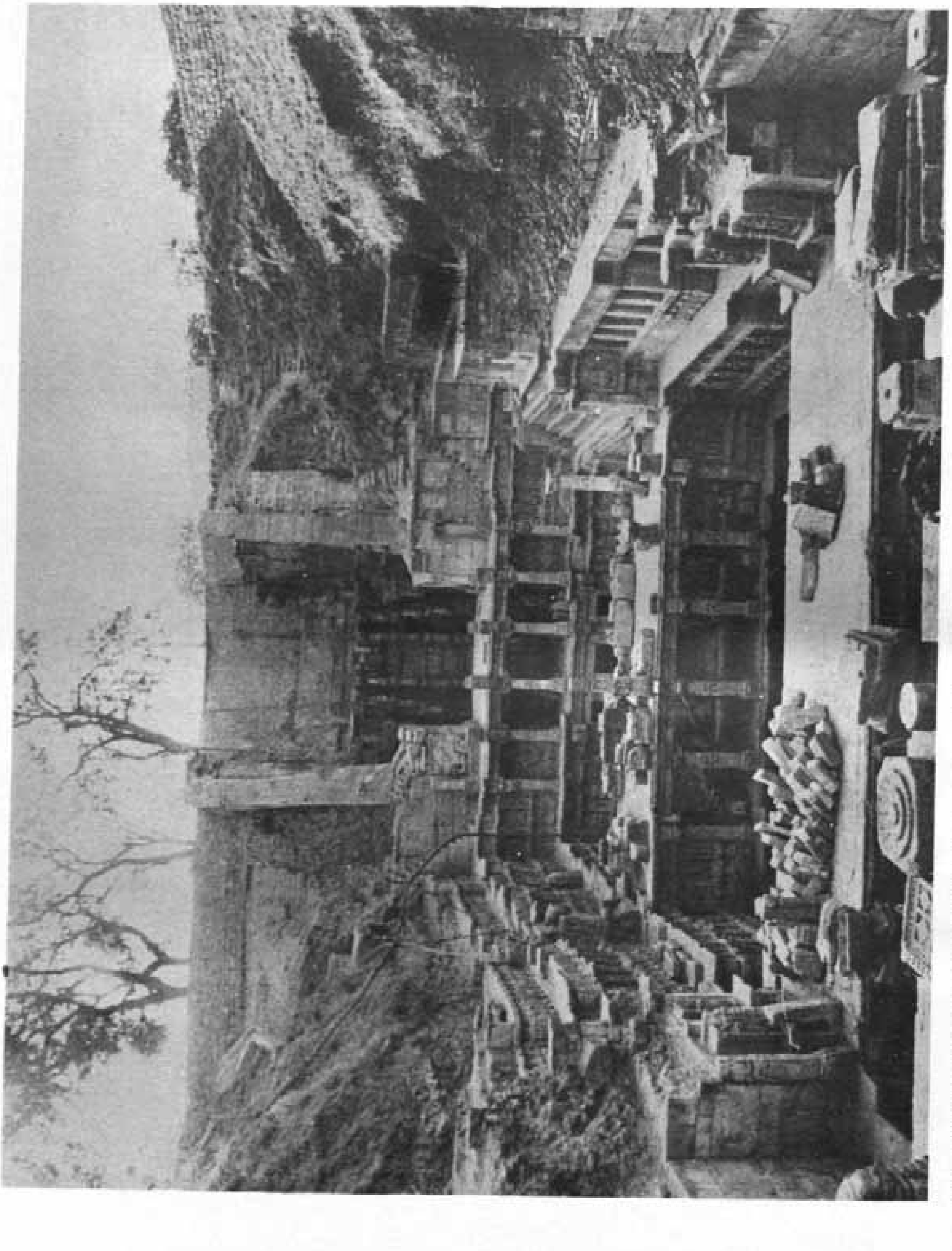
167 Ahmedabad Baba Lauli's mosque : After conservation. *See page 229*



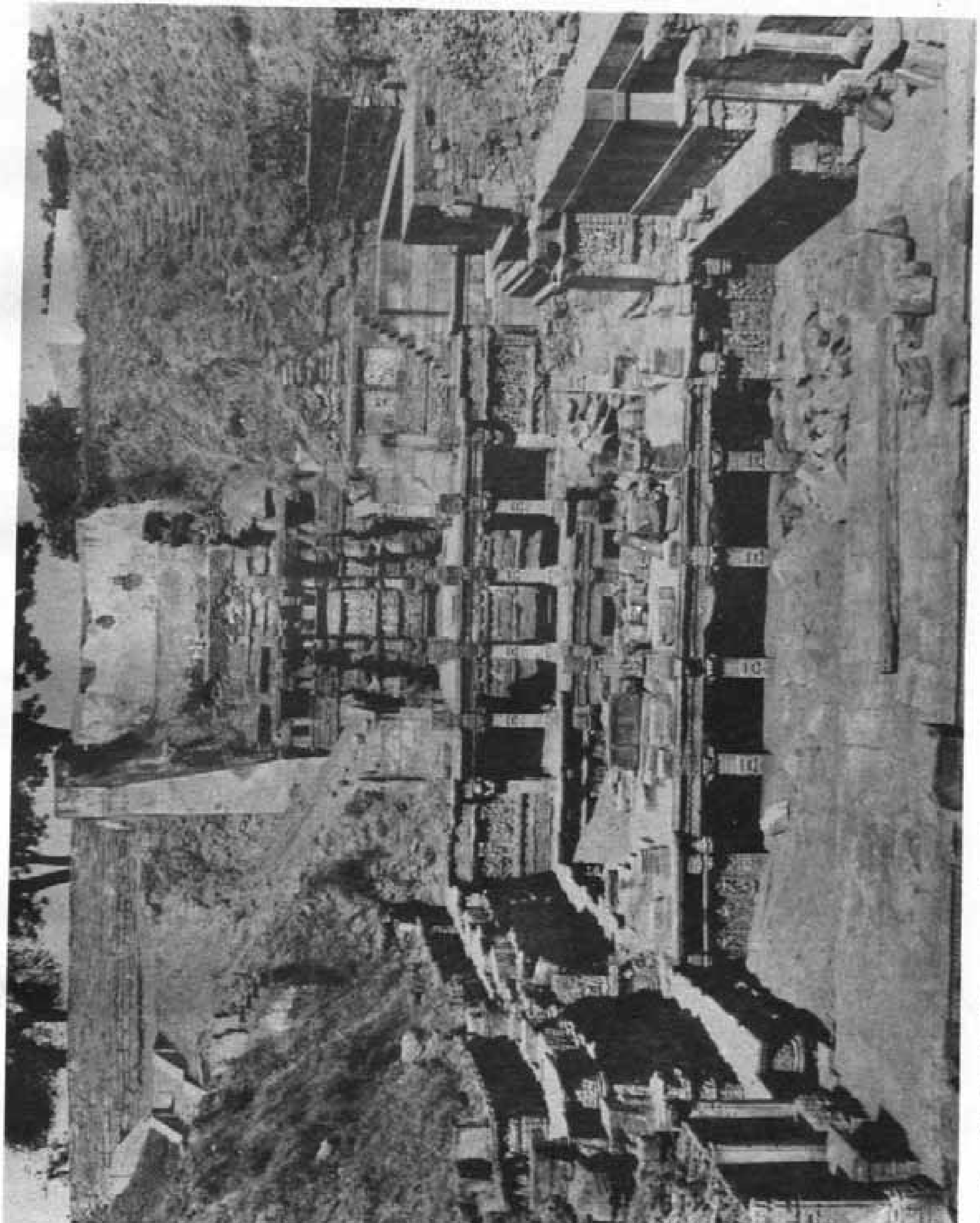
168 Ahmedabad, Baba Lauli's mosque : General view before conservation. *See page 229*



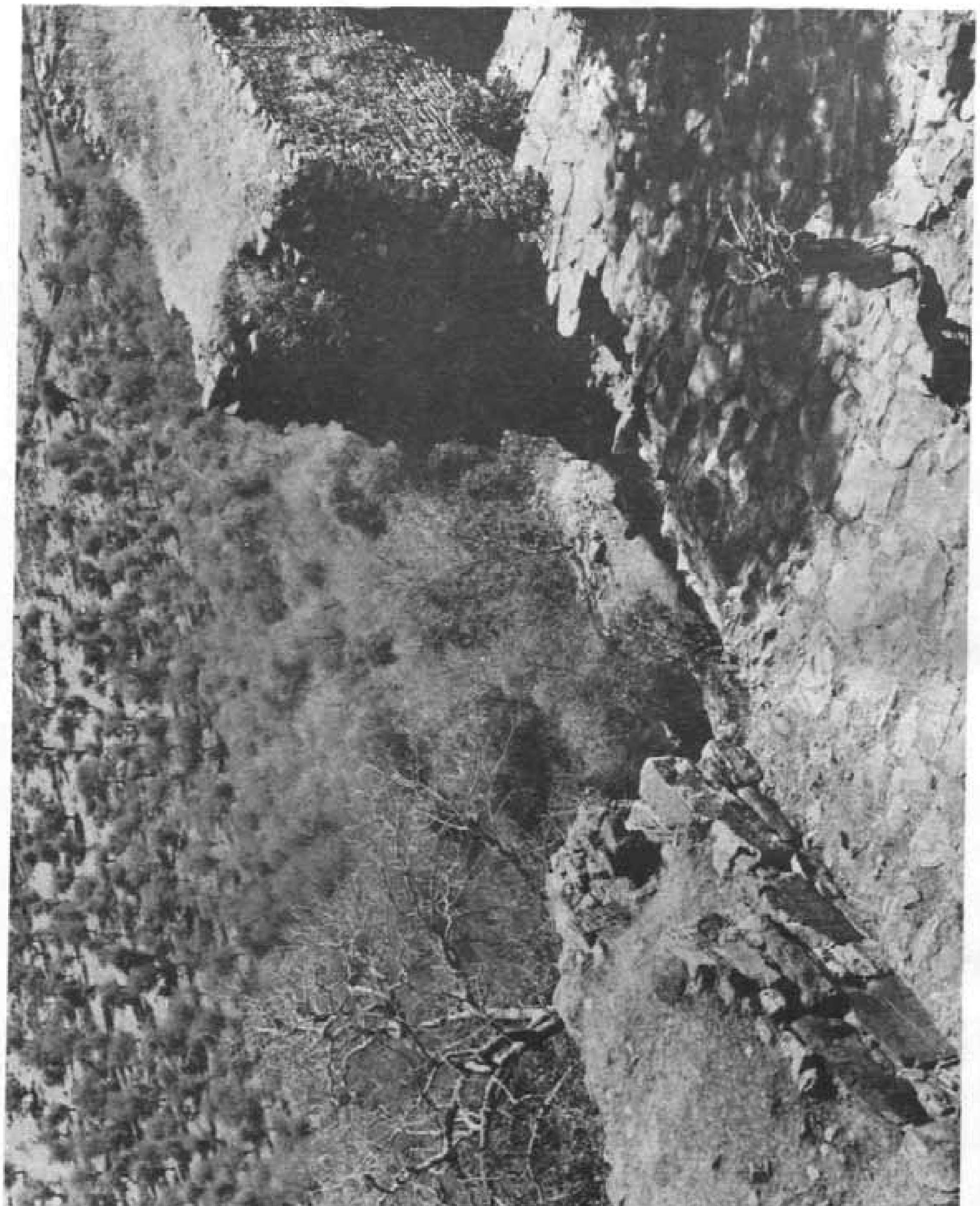
169 Ahmedabad, Baba Lauli's mosque : General view after conservation. *See page 229*



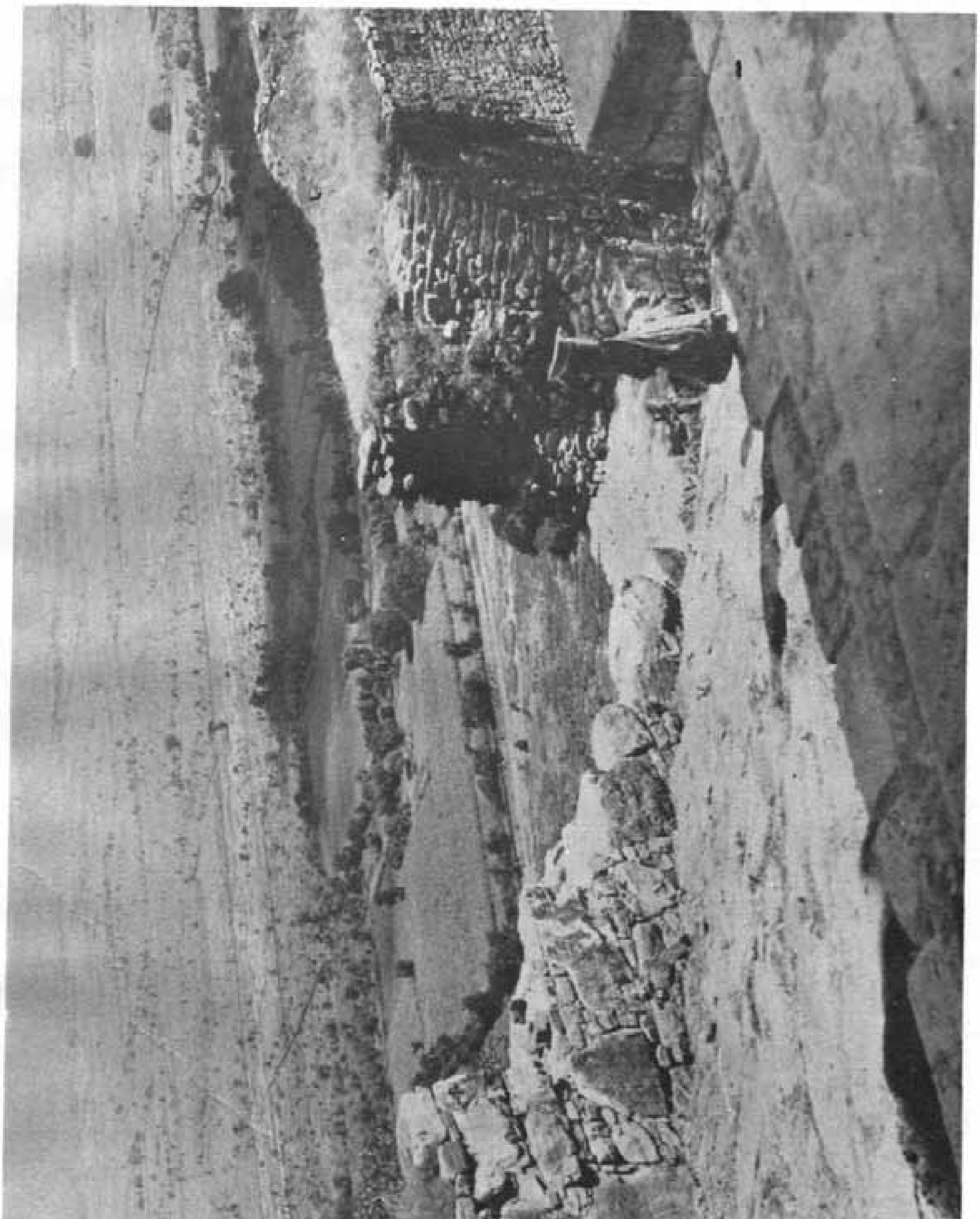
170 Patan,Rani-ki-vab : Before conservation. *See page 230*



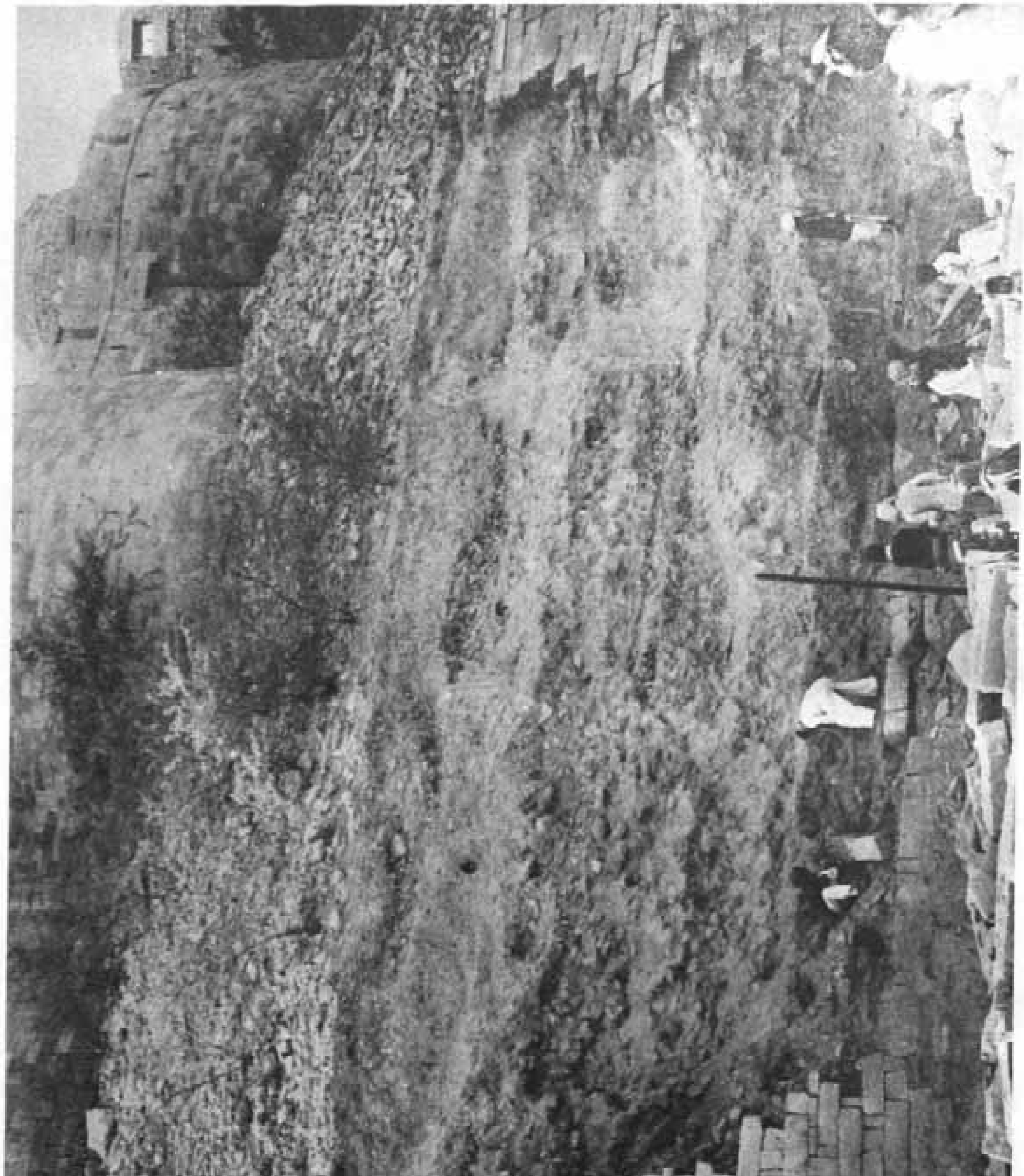
171 Patan, Rani-ki-vab : After conservation. *See page 230*



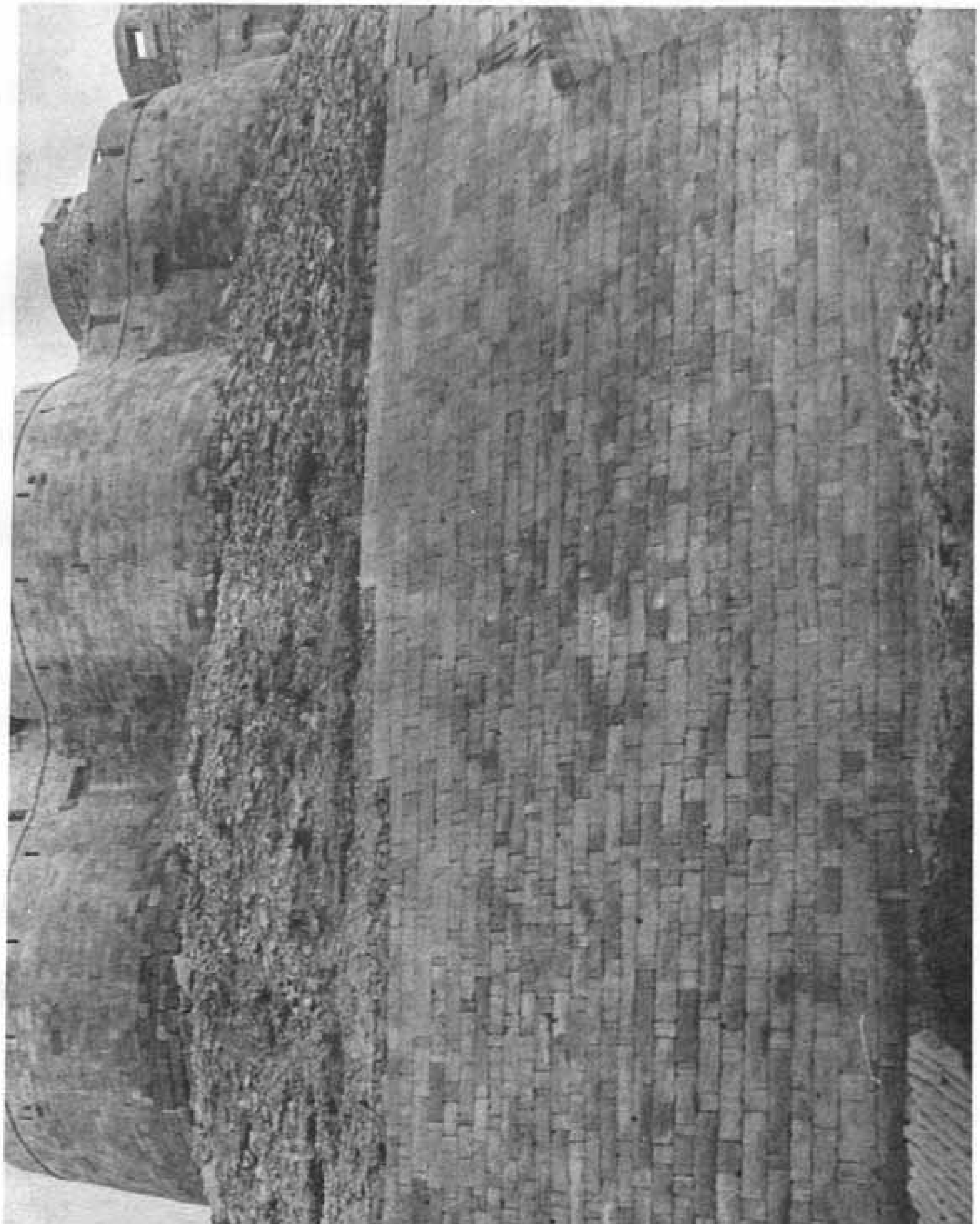
172 Chitorgarh Fort : Fort wall near Suraj Pole before conservation. *See page 230*



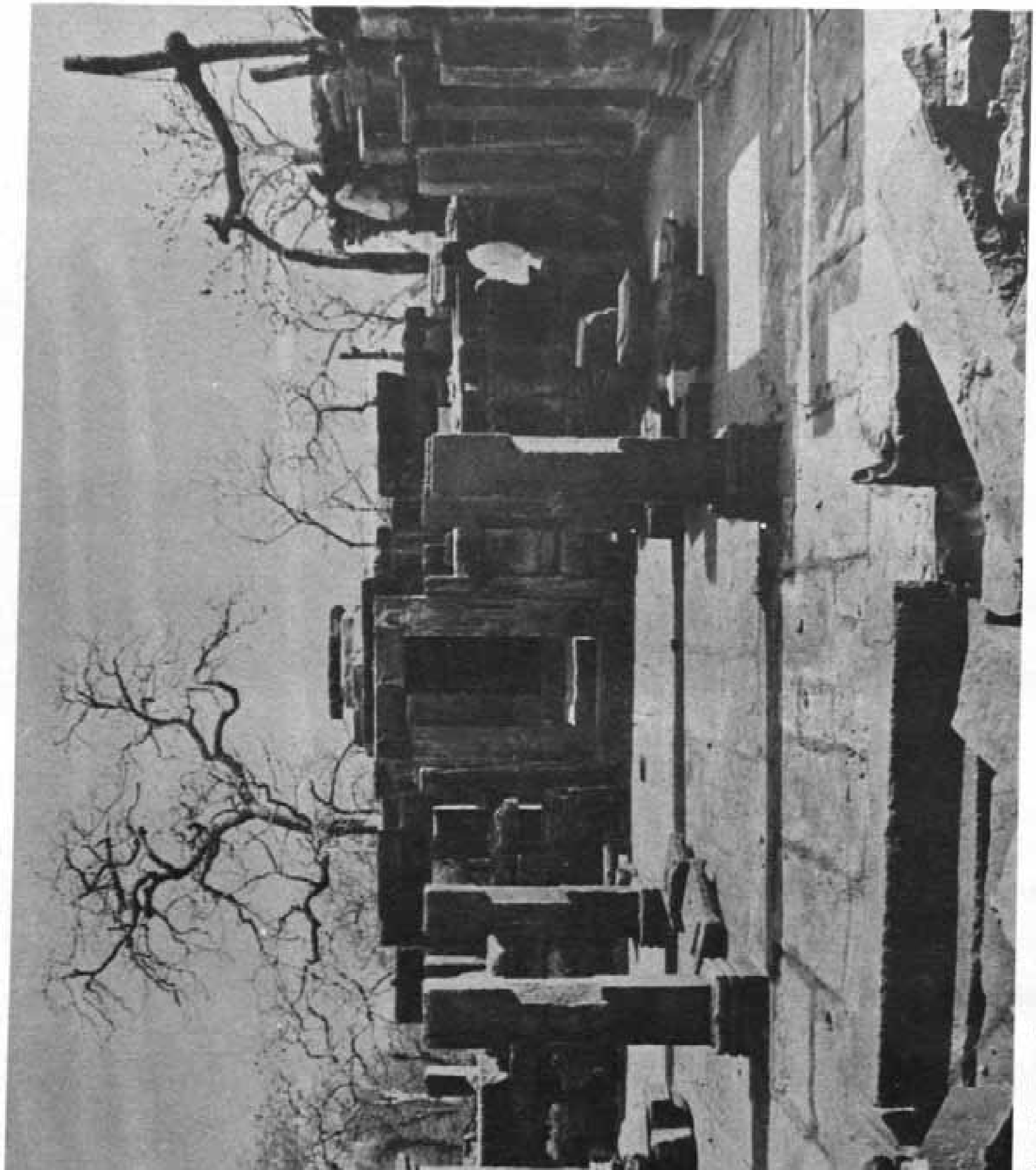
173 Chitorgarh Fort : Fort wall near Suraj Pole after conservation. *See page 230*



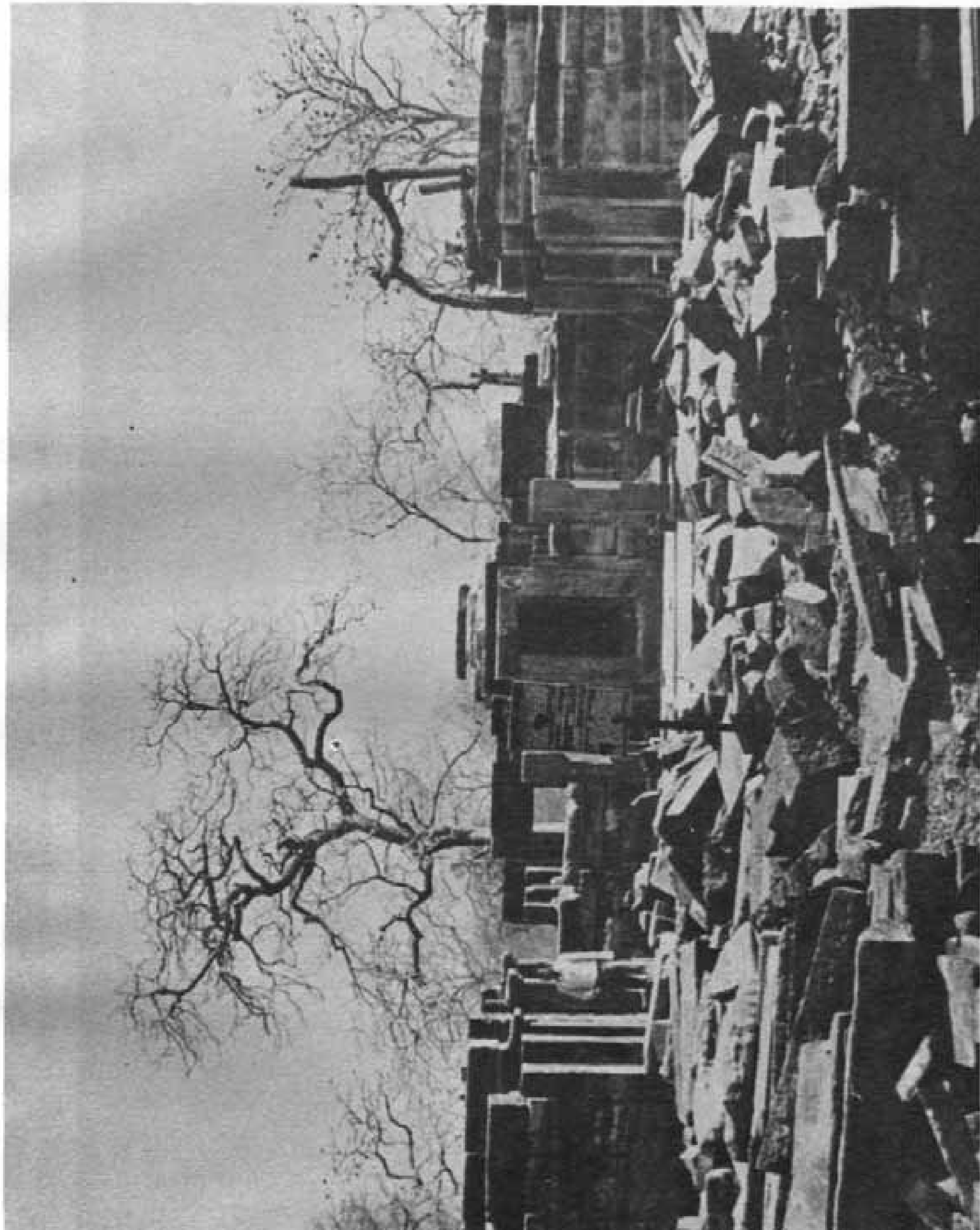
174 Jaisalmer Fort : Lower fortification wall near nichipole before conservation. *See page 231*



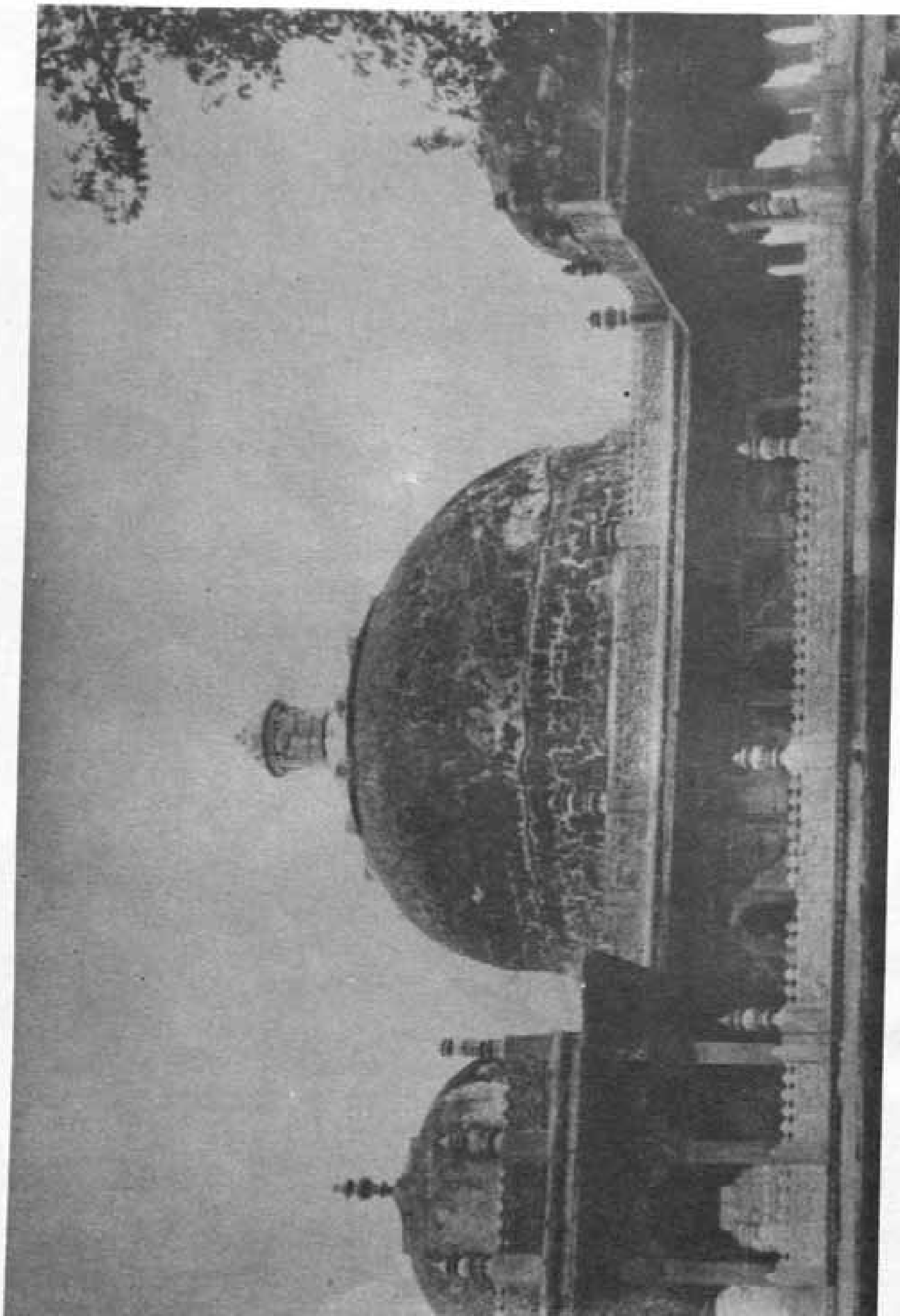
175 Jaisalmer Fort : Lower fortification wall near nichipole after conservation. *See page 231*



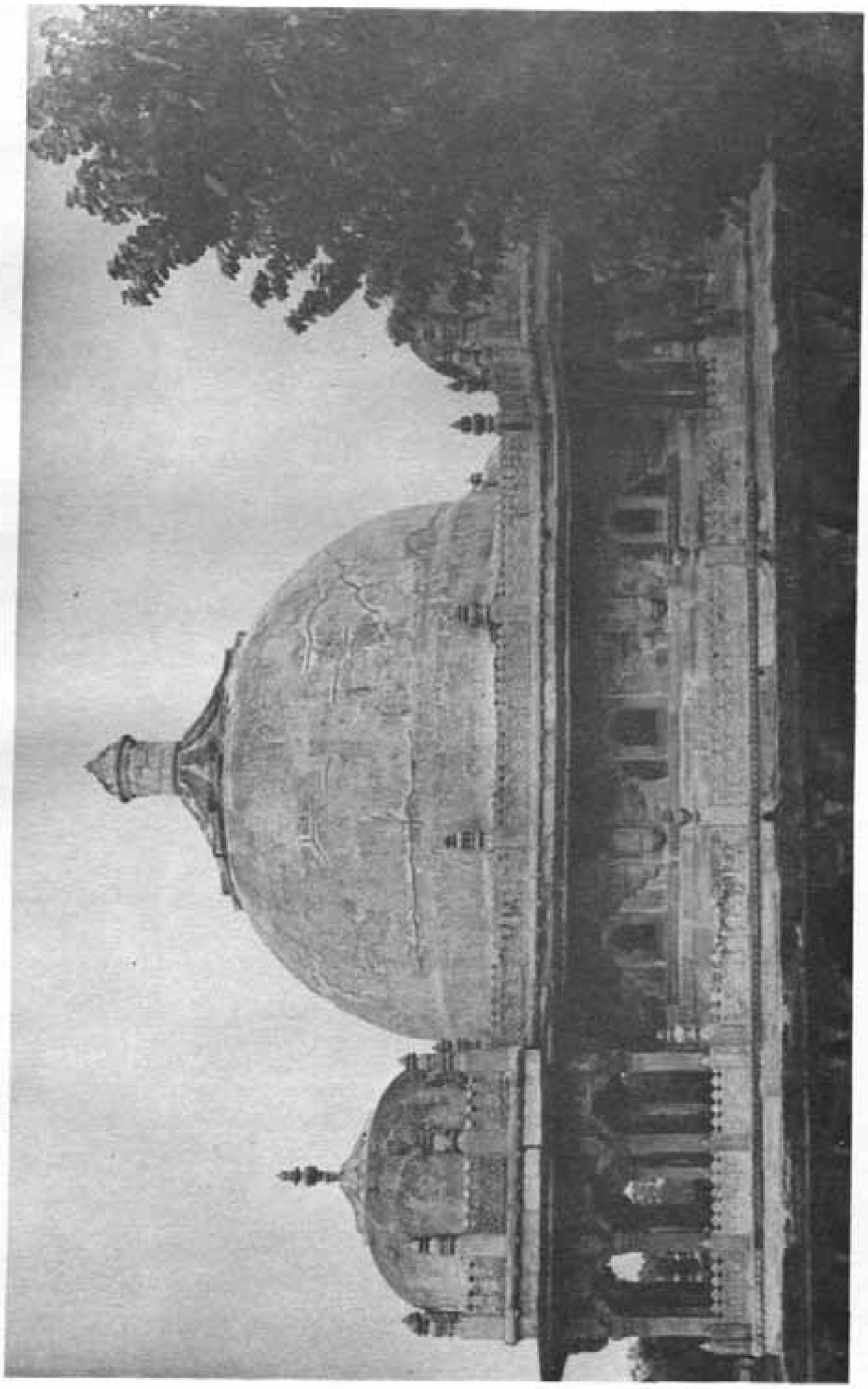
176 Kishanvilas Jain Temple complex : Before conservation. *See page 231*



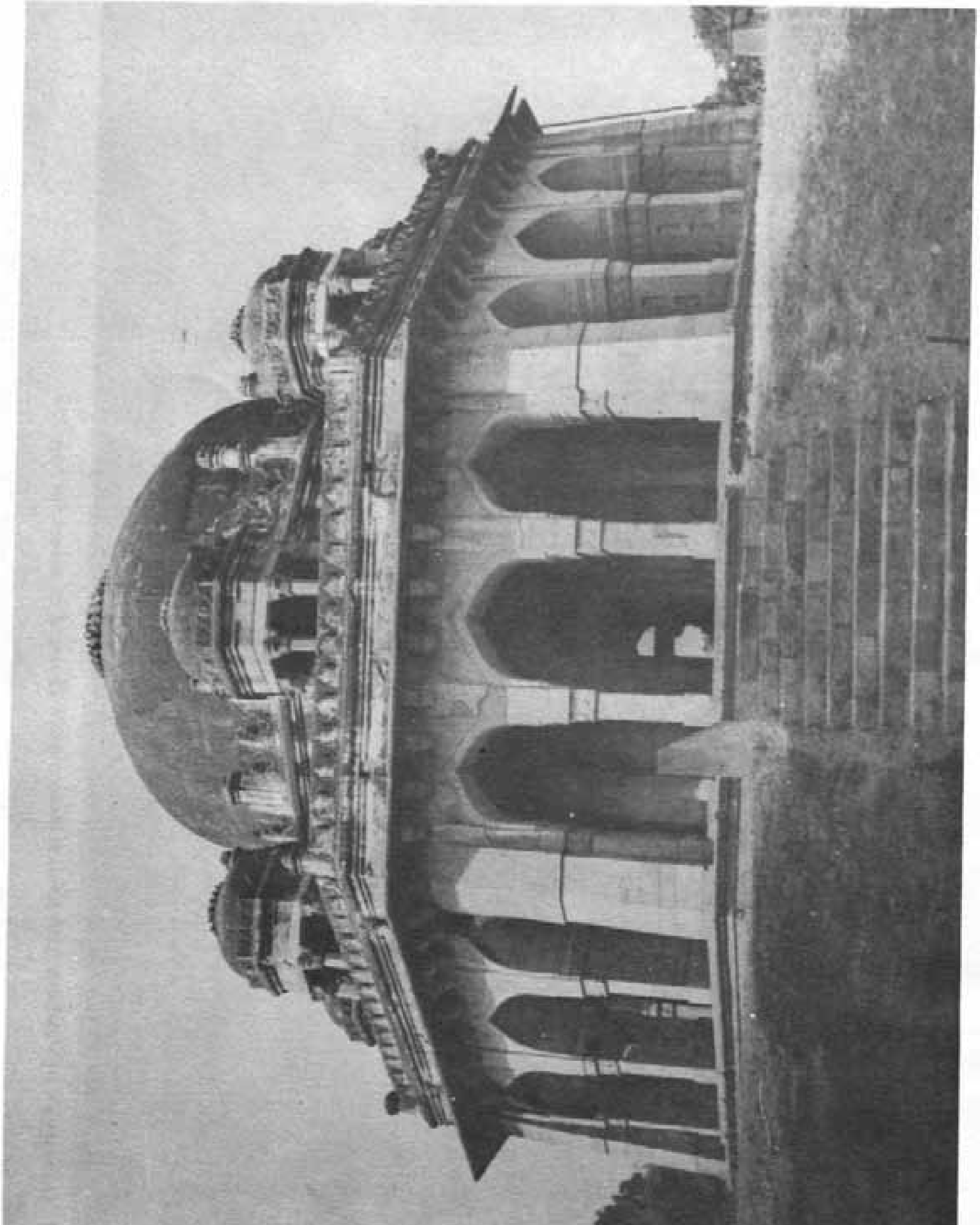
177 Kishanvilas Jain Temple complex : After conservation. *See page 231*



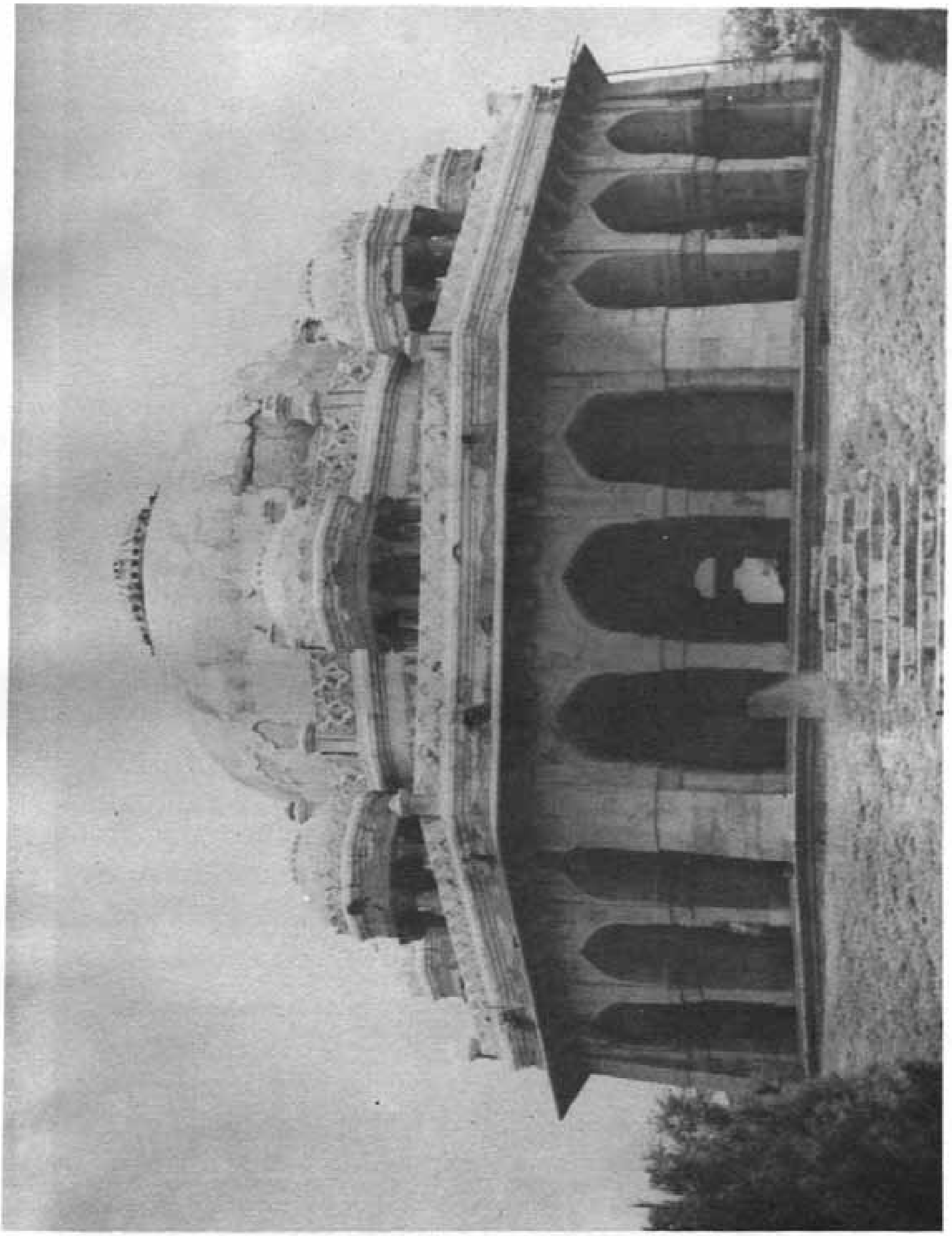
178 General view of Makdumb Shah tomb at Maner : Before chemical treatment. *See page 236*



179 General view of Makdumb Shah tomb at Maner : After Chemical treatment *See page 236*



180 General view of mohammed Shah Tomb at Delhi : Before chemical treatment. *See page 237*



181 General view of Mohammed Shah Tomb at Delhi : After chemical treatment *See page 237*



183 Sujanpur Tira : Painting on the wall of the verandah of Narbadeswar temple before chemical treatment. *See page 242*



184 Sujanpur Tira : Painting on the wall of the verandah of Narbadesvar temple after chemical treatment. *See page 242*



185 Tabo : Painting on northern wall of chamulang gumpha before chemical treatment. *See page 242*



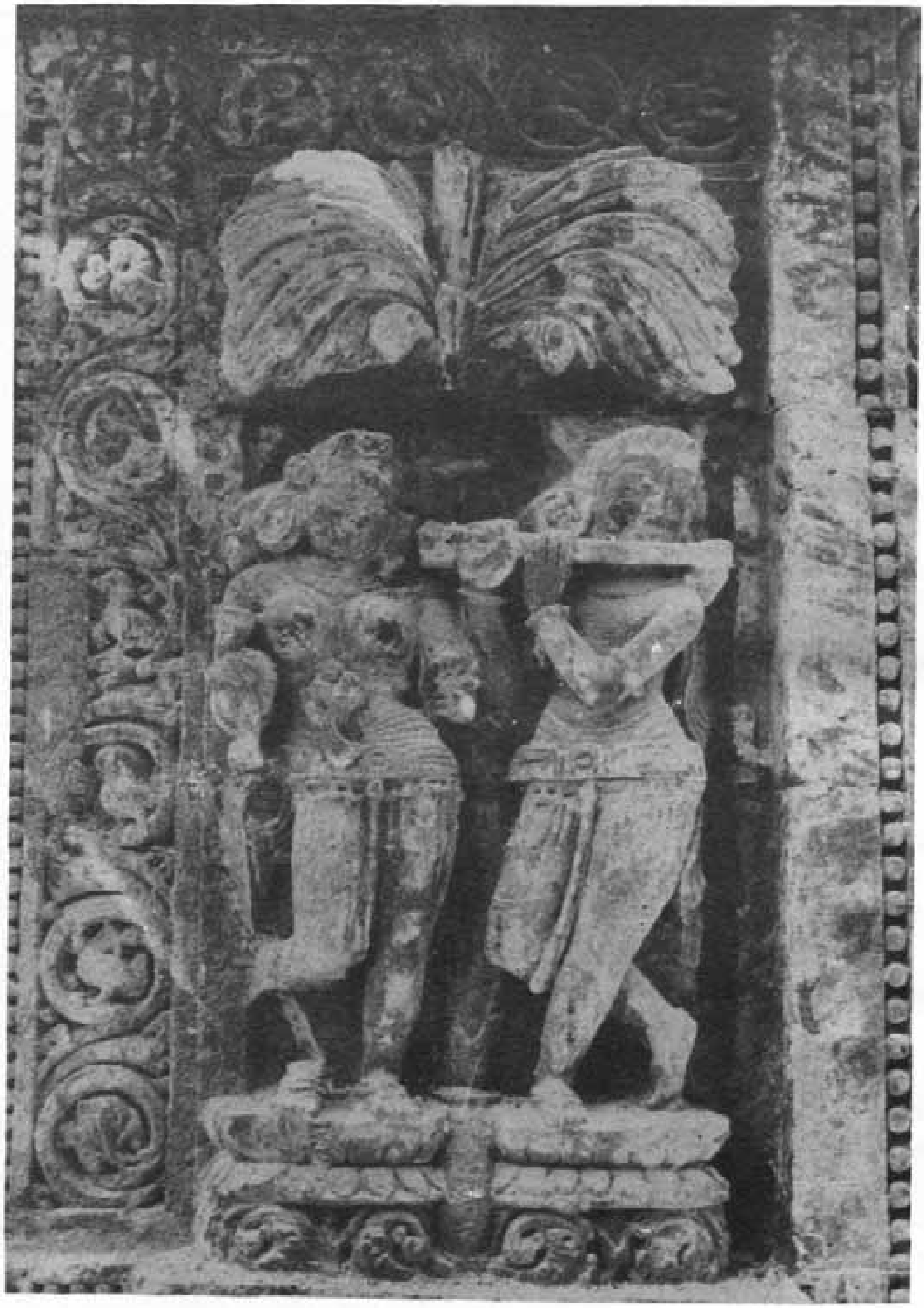
186 Tabo : Painting on northern wall of chamulang gumpha after chemical treatment. *See page 242*



187 Ajanta Cave 17 : East aisle, east wall and panel No. 9 before chemical treatment. *See page 244*



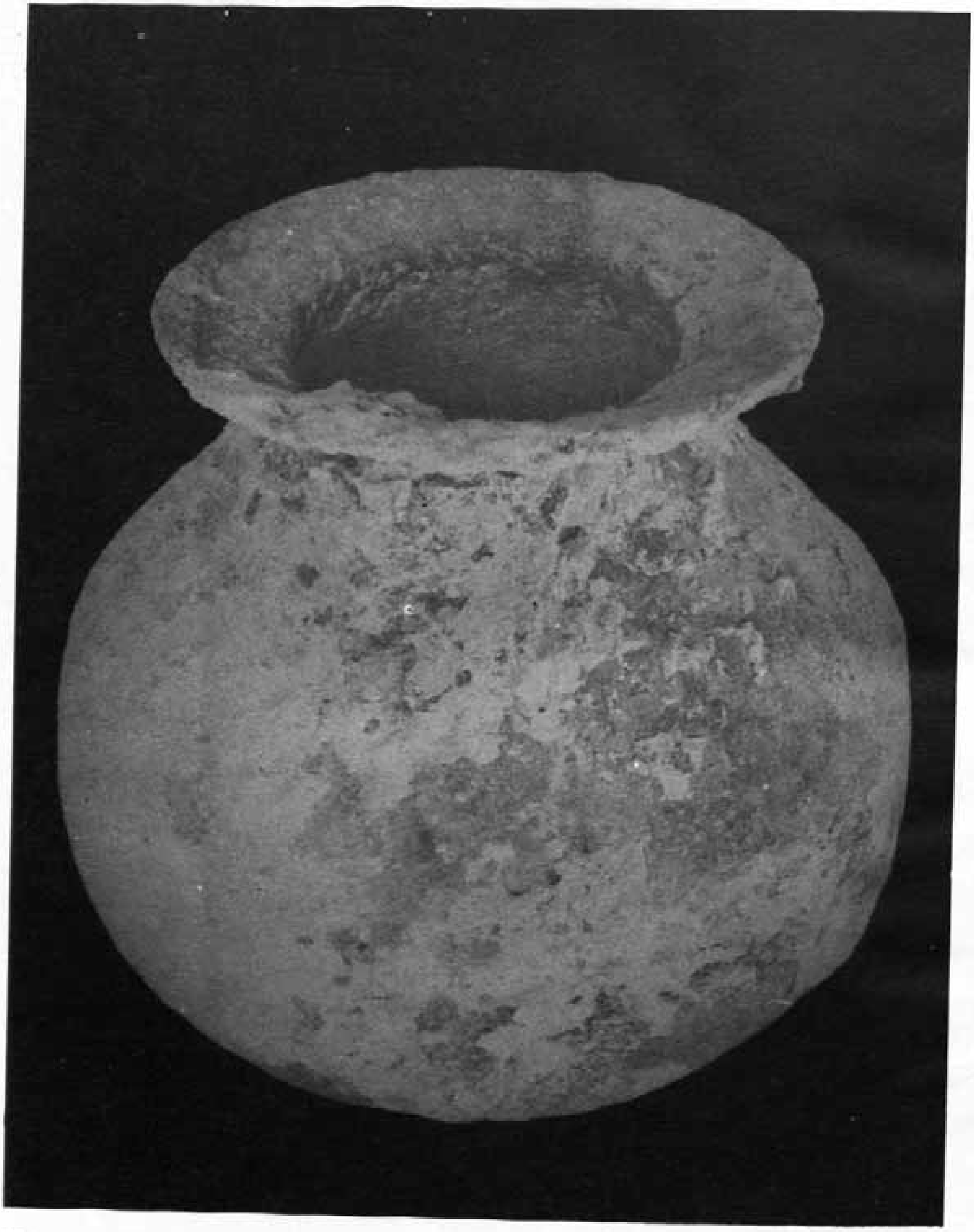
188 Ajanta Cave 17 : East aisle, east wall and panel No. 9 after chemical treatment. *See page 244*



189 Jagannath temple at Puri : Sculpture on the southern side of the temple before chemical treatment, *See page 245*



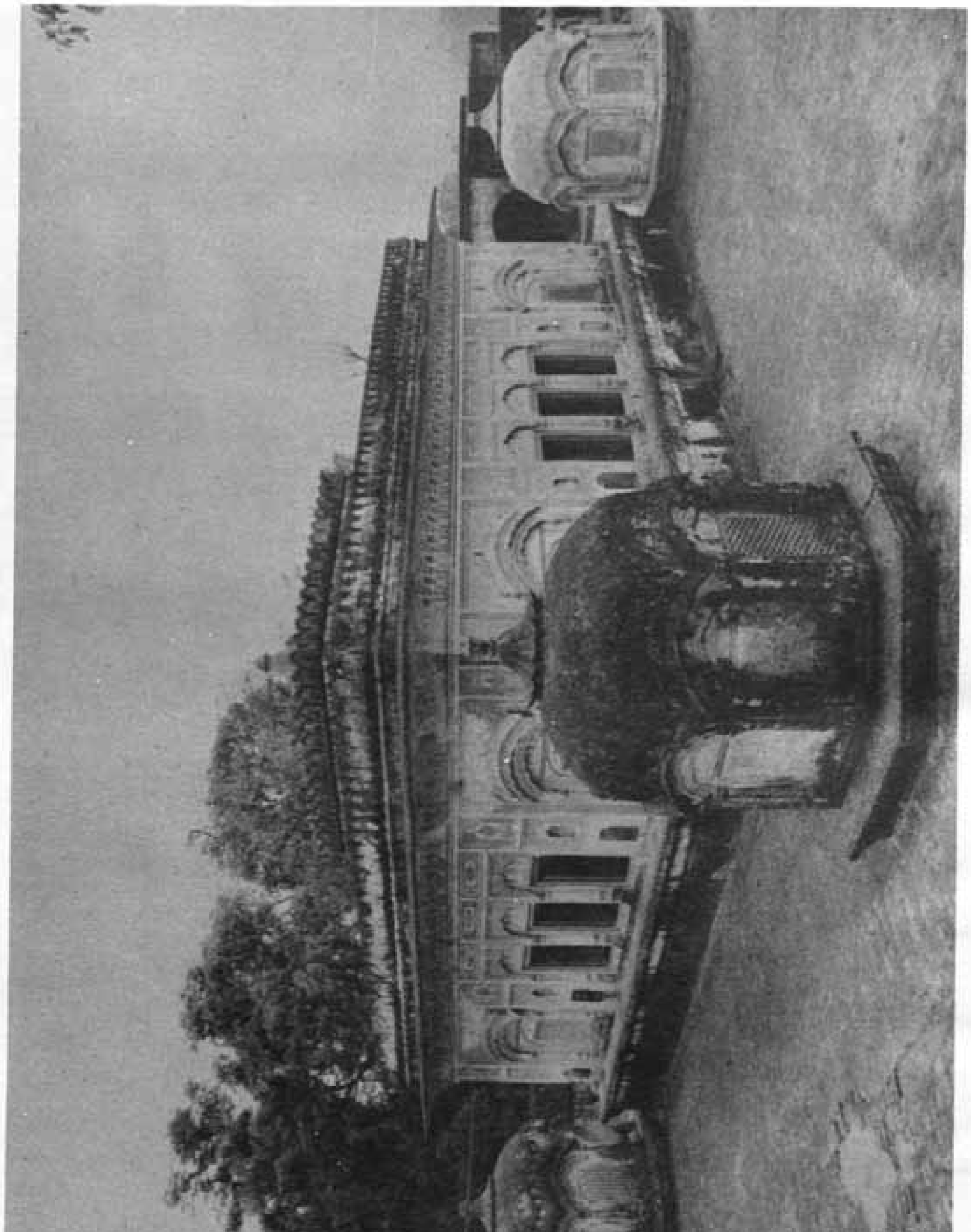
190 Jagannath temple at Puri : Sculpture on the southern side of the temple after chemical treatment.
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191 Copper Pot of Sringaverpura : Before chemical treatment. *See page 248*



192 Copper Pot of Sringaverpura : After chemical treatment. *See page 248*



182 Sujanpur Tira : Gneral view of the Narbadeswar temple during chemical preservation. *See page 242*